



VALVE TESTING  
MANUAL





### Model 7 Universal AVOMETER

A multi-range A.C./D.C. instrument of B.S. 1st grade accuracy, providing 50 ranges of readings on a 5-in. hand calibrated scale. Range selection is by means of two rotary switches, for A.C. and D.C. respectively. A press button provides an additional range for each value of current and voltage shown on the switch knobs. Current consumption at full scale deflection is 1mA. or 2mA. according to whether press button is used or not. Total resistance is 500,000 ohms. By means of an external accessory (the Universal Avometer Power Factor and Wattage Unit) power factor and power can be measured in A.C. circuits. An automatic cut-out provides protection against damage through overload.

**Current :** A.C. and D.C. 0 to 10A.

**Voltage :** A.C. and D.C. 0 to 1,000V.

**Resistance :** Up to 40 megohms.

**Capacity :** .01 to 20 mFds.

**Audio-Frequency Power Output :** 0-2W.

**Decibels :** -25Db. to +16Db.

**Size :** 8 x 7½ x 4½ ins. **Weight :** 6½ lbs.

### Model 40 Universal AVOMETER

A similar instrument to the Model 7 Avometer described above, but providing 40 ranges of current, voltage and resistance. Total resistance is 200,000 ohms.

**Current :** A.C. and D.C. 0 to 12 amps.

**Voltage :** A.C. and D.C. 0 to 1,200 volts.

**Resistance :** Up to 1 megohm.

**Size :** 8 x 7½ x 4½ ins. **Weight :** 6½ lbs.

THE phenomenal progress of recent years in electrical engineering owes much to the contemporary advances in the design of electrical measuring instruments.

The equipment of a laboratory for making electrical measurements and tests can involve an expenditure of hundreds of pounds. Likewise the test gear essential to the work of the radio service engineer can also be a source of considerable expense.

This difficulty is largely surmounted, and other advantages are conferred, by the use of modern multi-range testing instruments, which afford maximum usefulness with a reasonable initial outlay.

"AVO" Instruments are scientifically designed on sound principles, being the outcome of many years of successful experience by the pioneers and leading manufacturers of multi-range instruments. Before leaving our factory, every "Avo" Instrument is tested and adjusted to give a high degree of accuracy and constancy of performance.

### Model 8 Universal AVOMETER

A recent version of the Universal Avometer having a sensitivity of 20,000 ohms per volt on all D.C. ranges, and 1,000 ohms per volt on A.C. ranges from 100V. upwards. Accuracy on D.C. current ranges and A.C. ranges is to B.S. first grade, and on D.C. voltage ranges is 2% of indication from full scale to half scale deflection, and 1% of full scale value below half scale deflection.

In addition to the many well-known Avometer features, such as the automatic overload protection device, dual-knob range selection, etc., it has a push button for reversing the polarity of the movement to obviate the inconvenience of changing over the leads when encountering opposite potentials in respect to a common reference point.

**Voltage :** A.C. and D.C. 2.5 to 2,500 volts.

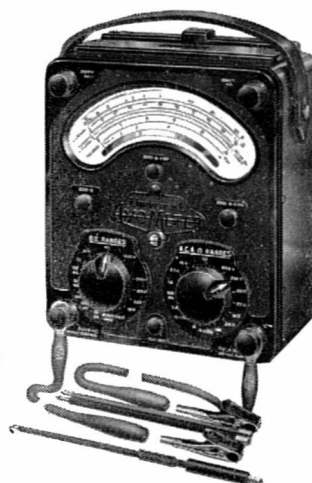
**Current :** A.C. and D.C. 0 to 10 amps.

**Resistance :** 0-20 megohms with internal batteries.

0-200 megohms with external D.C. supply

**Decibels :** -15Db. to +15Db.

**Size :** 8½ x 7½ x 4½ ins. **Weight :** 6½ lbs.





# Electrical TESTING INSTRUMENTS



## 'AVO' Wide-Range SIGNAL GENERATOR

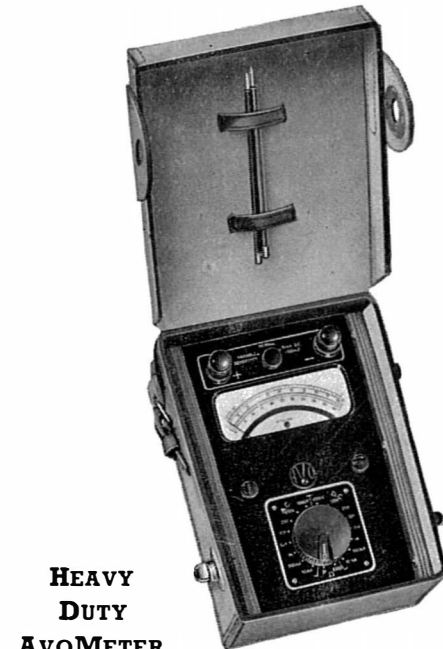
An R.F. Generator of remarkably wide range and accuracy of performance with turret coil switching, providing 6 frequency ranges :—

50 Kc/s-150 Kc/s.	1.5 Mc/s-5.5 Mc/s.
150 Kc/s-500 Kc/s.	5.5 Mc/s-20 Mc/s.
500 Kc/s-1.5 Mc/s.	20.0 Mc/s-80 Mc/s.

The H.F. circuit is a modified Colpitts Oscillator giving good waveform and sensibly constant level of signal over the full frequency ranges. The instrument operates on A.C. mains, 100-130V. and 200-260V., 50-60 c/s.

Size :  $12\frac{1}{2} \times 9 \times 5\frac{1}{2}$  ins. Weight : 12 lbs. 6 ozs.

Battery Model also available covering a frequency band of 50 Kc/s-70 Mc/s.



## HEAVY DUTY AvOMETER

An A.C./D.C. moving coil meter specially designed for use under conditions where an exceptionally robust and portable instrument is required. 18 ranges of direct readings on a  $3\frac{1}{4}$ -in. scale.

**Current :** A.C. and D.C. 10mA, 100mA, 1A, 10A.

**Voltage :** A.C. and D.C. 10, 25, 250, 1,000V.

**Resistance :** 0-500 ohms. (Midscale 12.5 ohms.)  
0-50,000 ohms. (Midscale 1,250 ohms.)

**Sensitivity :** D.C. voltage ranges, 1,000 ohms. per volt.

A.C. voltage ranges except 10-volt range, 500 ohms. per volt.

10-volt A.C. range, 200 ohms. per volt.

Size :  $7\frac{3}{8} \times 5\frac{3}{8} \times 4$  ins. Weight : 5 $\frac{1}{2}$  lbs.

## 'AVO' LIGHT METER

This pocket size photo-electric cell instrument gives direct readings in both foot candles and lux units. The scale, calibrated from 0-50 foot candles and 0-500 lux, is very open at the lower end, enabling readings as low as one foot candle to be read with rapidity and ease. A switch multiplier increases the range to 250 foot candles and 2,500 lux. The Instruction Book provided with the instrument contains lists of recommended illuminations for all kinds of interiors.

Size :  $2\frac{3}{8} \times 2\frac{3}{8} \times 1\frac{1}{8}$  ins. Weight : 7 ozs.



## Electrical TESTING INSTRUMENTS



### 'Avo' ELECTRONIC TESTMETER

A highly stable thermionic D.C. Millivoltmeter with subsidiary circuit switching giving 56 ranges of readings as follows:—

**D.C. Volts :** 5.0mV. to 10,000V. Max. Input Resistance 110 megohms.

**D.C. Current :** 0.5 $\mu$ A to 1A. (250mV. drop on all ranges).

**A.C. Volts :** 0.1V. to 2,500V. R.M.S. up to 2 Mc/s. With diode probe external 0.1V. to 250V. R.M.S. usable to 200 Mc/s.

**A.C. Output Power :** 5mW. to 5 watts in 6 different load resistances from 5 to 5,000 ohms.

**Decibels :** —10Db. to +20Db. Zero level 50mW.

**Capacity :** .0001 $\mu$ F to 50 $\mu$ F.

**Resistance :** 0.2 ohm to 10 megohms.

**Insulation :** 0.1 megohm to 1,000 megohms.

**Power Supply :** 100-130V. and 200-260V., 50-60 c/s. A.C.

Size : 12 $\frac{1}{2}$   $\times$  9  $\times$  5 $\frac{1}{2}$  ins. Weight : 12 $\frac{1}{2}$  lbs.



### 'Avo' ELECTRONIC TEST UNIT

An instrument designed to provide, at reasonable cost, electronic amplification facilities for the measurement of small values of A.C. Voltages, Inductance, Capacity and "Q" at radio frequencies. May be used with any Valve Voltmeter and Signal Generator of good wave form, but the ranges have been selected specially to suit those of the "Avo" Electronic Testmeter and the "Avo" Wide-Range Signal Generator. The instrument operates on A.C. mains, 100-130V. and 200-260V., 50-60 c/s.

Size : 12 $\frac{1}{2}$   $\times$  9  $\times$  5 $\frac{1}{2}$  ins. Weight : 9 lbs.

### 'Avo' UNIVERSAL BRIDGE

A self-contained 50 c/s. Bridge having 20 calibrated ranges for measuring Resistance, Capacity and Inductance over an extremely wide range. The value of the unknown impedance is directly indicated and further provision is made for measuring the leakage of condensers by the flashing Neon method at D.C. test voltages of 25, 50, 150, 250, 350 and 450 volts.

**Resistance :** 0.5 ohm to 50 megohms.

**Capacity :** 5pF. to 50mFds.

**Inductance :** 50mH. to 500H.

**Power Supply :** 100-130 and 200-260V., 50-60 c/s. A.C.

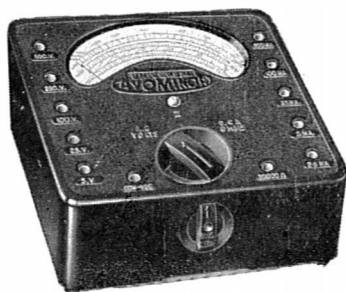
Size : 13  $\times$  10 $\frac{1}{4}$   $\times$  5 ins. Weight : 9 lbs.







# Electrical TESTING INSTRUMENTS



## Universal AVOMINOR—Model 1

A small but highly accurate moving-coil instrument for measuring A.C. and D.C. current and resistance. Total resistance is 200,000 ohms. on 500V. range. 22 ranges of readings on a 3-in. scale.

**D.C. Voltage :** 0-500V.

**D.C. Current :** 0-500mA.

**A.C. Voltage :** 0-500V.

**Resistance :** 0-10 megohms.

Size :  $4\frac{3}{4} \times 3\frac{7}{8} \times 1\frac{7}{8}$  ins. Weight : 18 ozs.

Supplied complete with leads, interchangeable crocodile clips and testing prods, and instruction book.

### The following **ACCESSORIES** are available for 'Avo' Testing Instruments.

AvoMeter Voltage Multipliers.

AvoMeter Transformers for  
A.C. Current Measurements.

AvoMeter Resistance Range  
Extension Units.

AvoMeter Shunts for D.C. Current

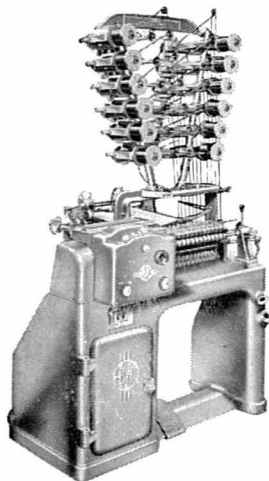
AvoMinor Voltage Multipliers.

AvoMinor Resistance Range  
Extension Units.

AvoMinor Shunts.

*Leather Cases are available for most Instruments.*

● A Comprehensive Guide to the complete range of 'Avo' Instruments is available.



## DOUGLAS and MACADIE COIL WINDERS

The Machine illustrated is the "Douglas" Fully Automatic Multi-Winder, for the high-speed production of large quantities of coils with or without paper interleaving. It will produce round, square or rectangular coils up to 6in. each in length, and up to  $4\frac{1}{2}$ in. diameter. As many as 12 smaller coils can be wound simultaneously within the total available winding length of 15 inches, at headstock speeds of between 600 and 2,000 r.p.m.

Our complete catalogue illustrates twenty-seven different machines, ranging from a simple Hand-Winder to the Double-Bank Multi-Winder capable of producing 24 coils simultaneously, also Taping Machines and a Cotton Inserter Attachment.

*Sole Proprietors and Manufacturers :*

**THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO. LTD.**  
**WINDER HOUSE, DOUGLAS STREET, LONDON, S.W.1.**

Telephone : Victoria 3404-9.

Telegrams : Autowinda, Sowest, London.



FILAMENT VOLTAGE EXTENSION UNIT



VALVE BASE ADAPTORS





THE  
AVO  
VALVE TESTING  
MANUAL

SECOND EDITION  
1951



*PUBLISHED BY*  
THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO. LTD.  
WINDER HOUSE, DOUGLAS STREET, LONDON, S.W.1  
Telephone : VICtoria 3404-9



# FOREWORD

FOR more than a quarter of a century we have been engaged in the design and manufacture of "AVO" Electrical Measuring Instruments. Throughout that time we have consistently pioneered the design of modern multi-range instruments and have kept abreast of and catered for the requirements of the epoch-making developments in the fields of radio and electronics.

The success of our steadfast policy of maintaining high standards of performance in instruments of unexcelled accuracy, and making such instruments available at reasonable cost, is reflected in the great respect and genuine goodwill which "AVO" products enjoy in every part of the World.

It has been gratifying to note the very large number of instances where the satisfaction obtained from the performance of one of our instruments has led to the automatic choice of other instruments from the "AVO" range. This process, having continued over a long period of years, has resulted in virtual standardisation on our products by numerous Public Bodies, The Services, Railway Systems, and Post Office and Telegraph Undertakings throughout the world.

Our designers have thereby been encouraged to ensure that new instruments or accessories for inclusion in the "AVO" range fit in with existing "AVO" apparatus and serve to extend the usefulness of instruments already in use. Thus, the user who standardises on "AVO" products will seldom find himself short of essential measuring equipment, for, by means of suitable accessories, his existing equipment can often be adapted to meet unusual demands.

It is with pleasure that we acknowledge that the unique position attained by "AVO" is due in no small measure to the co-operation of so many users who stimulate our Research and Development staffs from time to time with suggestions, criticisms, and even requests for the production of entirely new instruments or accessories. It is our desire to encourage and preserve this relationship between those who use "AVO" Instruments and those who are responsible for their design and manufacture, and correspondence is therefore welcomed, whilst suggestions will receive prompt and sympathetic consideration.

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# **Introduction**

## **to**

### **THE "AVO" VALVE CHARACTERISTIC METER**

The problem of designing a Valve Testing Instrument capable of giving a true and comprehensive picture of the state of any valve, has always been one of considerable magnitude, increasing in complexity as new valve types are brought into general use.

For a quick general purpose test necessitating a minimum of time and technical effort, a mutual conductance figure will give an adequate idea of a valve's usefulness, and the original "AVO" Valve Tester was designed to test the efficiency of valves on this basis.

Whilst a Valve Tester must, of necessity, be accompanied by a data book correlating the results of the Tester with the condition of the valve in question, a purely empirical figure, if used as a standard, will always give rise to doubts in the mind of the operator. The instrument should therefore, produce a figure which can be compared with some standard quoted by the valve manufacturer, if the operator is to use his instrument with confidence. For this reason the "AVO" Valve Tester used the static zero bias mutual conductance figure as a basis of comparison, this figure being at that time almost universally quoted by the valve manufacturer.

In order to reproduce this standard correctly, it was also necessary to reproduce the stated values of DC anode and screen voltage, a matter of some considerable difficulty when it is realised that for any stated condition of anode and/or screen volts the corresponding electrode currents can vary over very wide limits, and in the case of valves of low initial anode current and high slope, the actuation of the control which produces the milliamp per volt reading might easily double the anode current flowing. With D.C. methods of testing the inherent internal resistance of the rectifying circuits used could be such as to give regulation errors which could cause results to be meaningless unless complicated thermionic stabilising circuits and a vast array of monitoring meters were used in all voltage supply circuits. Such complications would not only render the Tester of prohibitive price and size, but would considerably increase the complication of operation for the non-technical user.

The problem was overcome by the introduction of the AC method of operation (Patent No. 480751) by which means the necessary DC test conditions were correctly simulated and a true mutual conductance figure produced by the application of AC voltages of suitable amplitude to all electrodes. This enormously simplified the power supply problem, rendered regulation errors negligible, and obviated the necessity for voltage circuit monitoring.

The "AVO" Valve Tester thus fulfilled normal testing needs for a long period. During recent years, however, electronic techniques have become much more precise and the nature and multiplicity of valve types have continuously increased. The zero bias mutual conductance figure is seldom quoted by the valve manufacturers, who, usually, publish the optimum working point mutual conductance and voltage figures, and in a large number of cases give full families of curves, from which precise operation, under a variety of working conditions, can be judged. To cater for present day requirements therefore, a valve testing device should not only be capable of producing a working point mutual conductance figure at any reasonable value of anode, screen or grid voltage recommended by the manufacturers, but should also be capable, if necessary, of reproducing any one of the mutual characteristics associated with the valve in question. The instrument thus has to simulate the performance of a comprehensive valve measuring set up of laboratory type and yet, at the same time, be sufficiently cheap and simple to cater for the needs of the comparatively inexperienced radio test assistant. It is obvious that the very much wider application of an instrument of this class, would render the regulation difficulties, already referred to, much more intense.

Investigations were, therefore, put in hand to see whether the AC test method would reproduce DC conditions not only in respect of the mutual conductance figure taken at a single discrete point, but at all points on all characteristics from zero bias to cut off.

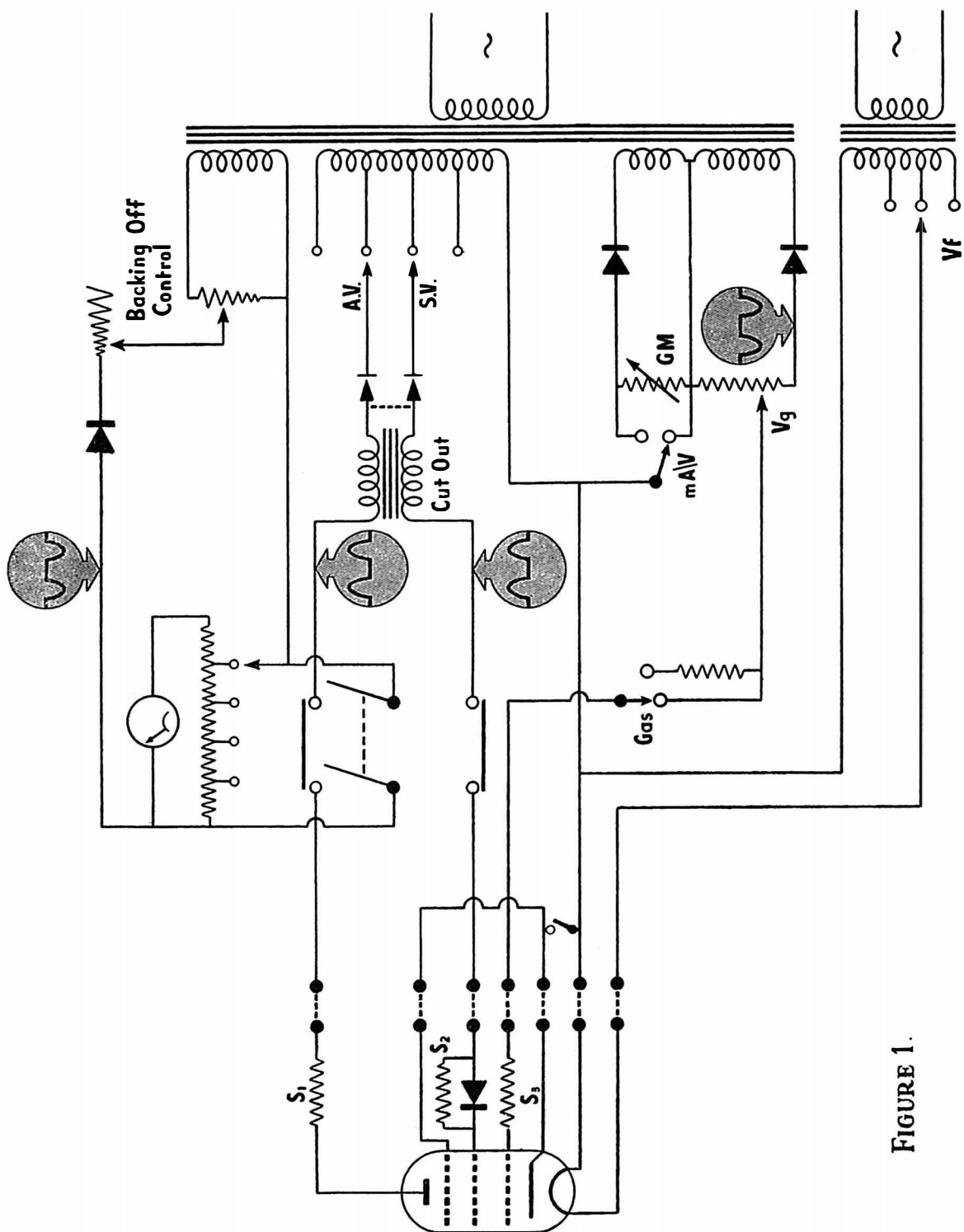


FIGURE 1.

In other words, it was necessary to determine whether the general function for a DC static valve characteristic

$$I_a = f \frac{(V_a + \mu_1 V_{g_1} + \mu_2 V_{g_2})}{R_a}$$

would hold when  $I_a$  was measured in terms of DC current, but when  $V_a$ ,  $V_{g_2}$  and, if necessary,  $V_{g_1}$ , were replaced by 50 cycle AC voltages of suitable magnitude. It was eventually found that a complete co-relation between these two sets of conditions was held when the grid voltage took the form of a sinusoidal wave form with the positive half cycle suppressed (in other words, rectified but completely unsmoothed AC), and the following relationships were maintained :—

$$\begin{aligned} V_a \text{ RMS} &= 1.1 \text{ } V_a \text{ indicated DC} \\ V_{g_2} \text{ RMS} &= 1.1 \text{ } V_{g_2} \text{ indicated DC} \\ V_{g_1} \text{ (mean unsmoothed)} &= 0.52 \text{ } V_{g_1} \text{ indicated DC} \\ I_a \text{ (mean DC)} &= 0.5 \text{ indicated } I_a \end{aligned}$$

From the above conditions, therefore, the required relationships were obtained which formed the basis of operation of the Valve Characteristic Meter (Patent No. 606707).

Such an instrument, whilst retaining the advantages of simplicity, size and reasonable price, resultant upon the elimination of complicated regulated DC supply systems and universal monitoring, would have the inherent regulation easily obtained from a well-designed AC transformer. It would enable a valve to be checked at any point on any one of its many mutual characteristics and if necessary would allow a full family of characteristics to be drawn.

#### The basic method of characteristic checking

The fundamental circuit of operation of the instrument is shown in Figure 1, the nature of the wave forms present in the various parts of the circuit being indicated thereon. As in the original Valve Tester, the process of obtaining a direct reading mutual conductance figure is simplified by the production of a backing off circuit, which balances out the deflection due to the standing anode current at the desired test conditions prior to the operation of the mutual conductance button. Only the desired figure appears on the meter scale, thus enabling the meter to be set at a sufficiently sensitive range for precise determination of mutual conductance. It will be noticed that the current flowing in this backing off circuit is similar in wave form, but precisely opposite in direction to the anode current, thus eliminating any undesirable ripple that could otherwise become apparent when the meter, after backing off, was set to a sensitive range.

#### The basic method of checking diodes and rectifiers

Any simple emission test at low applied voltage must necessarily give rise to a purely empirical figure for the valve in question which cannot necessarily be co-related with any one of the maker's characteristics and which, owing to the fact that it relates to the lower bend portion of the rectifier characteristic may vary very widely for any given type of valve. The important function of a rectifying valve is that it will, under suitable reservoir load conditions, produce sufficient current to operate the apparatus which it is intended to supply. This fundamental requirement, therefore, is the basis of rectifier testing in the Valve Characteristic Meter. A sufficiently high AC voltage is applied to operate the valve above the bend in its characteristic, and to ensure that its internal voltage drop is negligible. With a suitable reservoir condenser in circuit, the DC load is adjusted to correspond to a number of DC current conditions, i.e. 5mA, 15mA, 30mA, 60mA and 120mA. The actual current flowing in the load circuit is then indicated on a meter shunted to correspond with the DC load required. The meter reading will then indicate as a percentage, the comparative efficiency of the valve on the basis of this required DC load. Each half of a full wave rectifying valve is tested separately thus enabling matching of two halves to be checked and any tendency to produce hum by partial half waving to be indicated.

The pre-determined load figures are chosen so that they not only give a sufficiently wide range of currents to cater for the normal requirements of electronic apparatus, but also correspond to the DC maximum emission figures usually quoted by manufacturers



in their rectifying valve data. Signal diode valves are similarly tested, but a lower AC voltage is applied and comparison is made with a single DC load figure of 1mA, this figure being normally more than sufficient to cover the rectified signal current that would be obtained. The basic operating circuit of the diode and rectifier system is shown in Figure 2.

### Insulation Testing

To cover all eventualities, three distinct forms of insulation measurement are catered for in the Valve Characteristic Meter. Measurements are taken with DC applied voltages, and direct indication of the insulation value in megohms is shown on the meter scale. As an initial test, prior to the application of operating voltages to the valve, the rotation of a switch enables the insulation figure to be shown, which occurs between each of the valve electrodes taken in order and all the others strapped together. The denomination of the electrodes between which any breakdown exists will thus be automatically indicated and further, the continuity of the heater circuit is shown as a zero resistance at the heater (H) position of the switch.

With directly heated valves it is not uncommon for electrode sagging to occur on the application of heater voltage, with the result that a breakdown occurs between heater and an adjacent electrode. To show up this condition a test circuit is provided indicating the insulation resistance between the heater and cathode of a valve and all other electrodes strapped together when heater voltage has been applied.

Finally the very important factor of heater to cathode insulation when the heater is hot can be tested, the insulation again being shown directly in megohms, the usual cathode to heater connection being opened for this purpose and the applied voltage being in such a direction as to make the cathode positive with respect to the heater, thus avoiding false indications of insulation resistance due to electrode emission.

### Safety Cut-Out

To prevent damage to internal components of the Valve Characteristic Meter, due to inadvertent or deliberate shorting of the supply voltages, a safety cut-out is incorporated, operative when damaging overloads of AC current are taken from either the anode or screen voltage sources. The cut-out takes the form of a two circuit polarised electro-magnetic relay which has two windings incorporated in its electro-magnetic system, one associated with the screen voltage supply and one with the anode voltage supply. It will be appreciated that with the valve electrodes taking normal current, half wave DC pulses only will flow

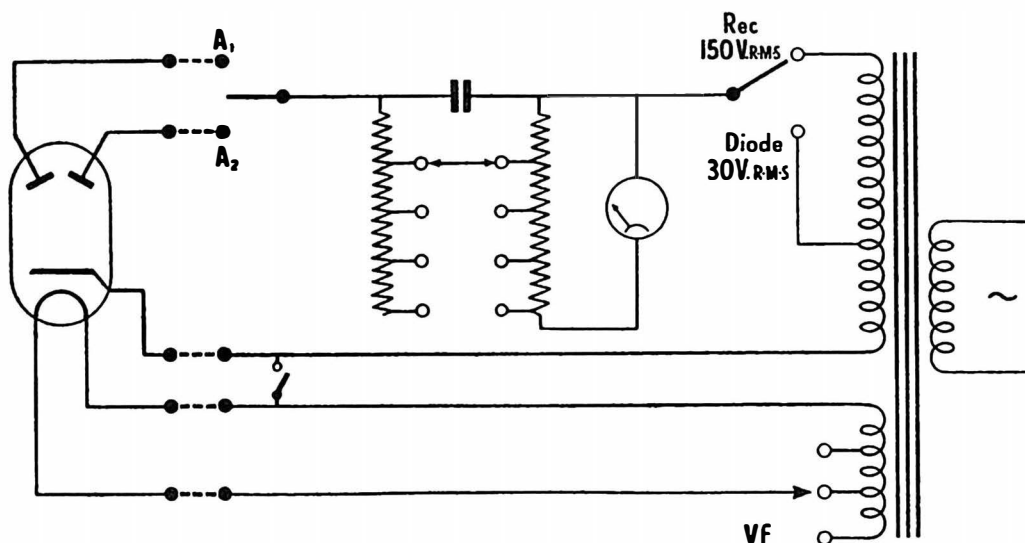


FIGURE 2

through these windings and the direction and magnitude of the windings are such that with anode current only flowing, or alternatively, with a considerably larger anode current than screen current flowing, the cut-out will be held in contact and the instrument will work normally. It is obvious, however, that if an internal valve short occurs on any one of its high voltage electrodes, or alternatively, if such a short is applied externally via the valve holder sockets, or other part of the circuit, or further if any internal short occurs associated with the anode or screen supply circuits, then the current flowing in these circuits will not take the form of uni-directional pulses, but will be ordinary AC current.

In such circumstances, the effect of the first half cycle of AC current in the reverse direction from normal will be such as throw out the cut-out and thus break both anode and screen supply circuits. The overload is, therefore, removed from the supply system and burn out of transformers and associate parts is obviated. Note that this protection does not apply in the case of a short applied to the heater voltage windings as these normally pass sinusoidal AC current. Further, if for any reason when testing a pentode the anode circuit should become disconnected (this can occur when the roller switch is wrongly set up) then the normal result would be for a damagingly heavy rectified current to flow in the screen circuit; the relative direction and magnitude of the two windings on the cut-out is then such that when the current in the screen circuit seriously exceeds the current in the anode circuit the cut-out is thrown and damage both to valve and circuit is obviated. It must be stressed that this cut-out will not operate upon the passage of normal heavy currents of a DC nature occurring in the valve anode circuit, and it thus will not protect the movement if the latter is wrongly set on a range not corresponding to the current passing. This problem is dealt with by ensuring that the movement is always set to its maximum current range when the probable magnitude of the current is unknown.

### THE VALVE PANEL AND SELECTOR SWITCH

The Valve Panel comprises 18 valve holders of the following types :—English—4/5 pin, 7 and 9 pin, 8 pin side contact, B7G, B8A, B8B (American Octal), B9G, English Octal, B3G, 4 and 5 pin Hivac : American—4, 5, 6 and small 7 pin UX, medium 7 pin UX and Octal. Provision is made by means of plug-in adaptors to cater for newly introduced valve bases such as B9A. These valve holders are all wired with their corresponding pins, according to the standard pin numbering, in parallel, i.e. all pins number one are wired together, all pins number two, and so on. This wiring combination is associated with the well-known "AVO" Multi-Way Selector Switch which enables any one of the nine standard pin numbers to be connected to any one of the electrode test circuits in the Valve Characteristic Meter proper, thus enabling any electrode combination to be set up for any normal valve holder.

It will be seen that the Selector Switch comprises nine thumb control rollers, numbered from left to right 1—9. This numbering appears on the moulded escutcheon immediately behind the rollers and corresponds to the valve pins in the order of their standard pin numbering. Thus valves with any number of base connections up to nine can be accommodated. Further, to accommodate top cap and other external valve connections a socket panel is provided with five sockets marked G1, S, A1, A2, D1 the markings corresponding to the valve electrode connection which is made externally to the valve.

Rotation of the rollers by the finger rim provided will reveal that each roller can be set in any one of ten positions, the setting in question being indicated in the window opening at the front of the escutcheon. The ten positions on the roller are marked as under :—

1	2	3	4	5	6	7	8	9	0
C	H—	H+	G	S	A	A2	D1	D2	E

The numbers are provided for ease of memorising and noting base combinations, but the corresponding electrode denominations are shown by the letter appearing in the escutcheon window immediately underneath the number, thus :—

- (1) C corresponds to Cathode.
- (2) H— „ „ Heater normally earthy or connected to negative L.T.  
in the case of a battery valve.
- (3) H+ „ „ the other Heater connection or centre tap.

- |     |    |   |   |   |
|-----|----|---|---|---|
| (4) | G  | „ | „ | Control Grid.   |
| (5) | S  | „ | „ | Screen Grid or $g_2$ .  |
| (6) | A  | „ | „ | normal anode of single or multiple valve. In the case of an Oscillator mixer valve, A represents the Oscillator anode.      |
| (7) | A2 | „ | „ | second anode of double valves, and in the case of Oscillator mixer valves, the mixer anode.                                 |
| (8) | D1 | „ | „ | the first diode anode of half and full wave signal diode and rectifier valves, diode and rectifier/amplifier combinations.  |
| (9) | D2 | „ | „ | the second diode anode of signal diode and rectifier valves, diode and rectifier/amplifier combinations.                    |
| (0) | E  | „ | „ | any earthed screen or screening electrode not operating under applied voltage conditions nor normally connected to cathode. |

### Procedure for setting up valve base connections

The standard procedure for setting up a valve ready for test is as follows. From some suitable source i.e. "AVO" Data Book, Valve Manufacturer's Data Leaflet or published manual of Valve Data, determine the pin basing connections for the valve, in order of their standard pin numbering. Rotate the rollers of the Selector Switch until the set up number or electrode letter combination appears in the window reading from left to right in order of the standard pin numbering. In the case of valves having less than nine pins, the free rollers on the right of the set up combinations corresponding to non-existent valve electrodes should be set at O(E). Insert the valve in the appropriate valve holder. With one of the leads provided connect any top cap or side connection on the valve to its appropriately marked socket, on the Socket Panel immediately above the Selector Switch. Note that the loctal valve holder having only eight normal electrodes has its centre lug connected to the ninth roller (corresponding to pin No. 9) to accommodate valves which have a cathode connection made to this lug.

The accompanying examples show how to co-relate the pin basing data and the equivalent set-up combination for a number of valves in common use.

<i>Valve Type</i>	<i>Set up Number</i>									<i>Base Diagram</i>
1. Osram MH4 indirectly heated triode. British 5-pin base.	6	4	2	3	1	0	0	0	0	
2. Osram U50 full wave rectifier directly heated. Octal base.	0	2	0	8	0	9	0	3	0	
3. Mullard PenA4 indirectly heated output pentode. British 7 pin base.	0	4	5	2	3	1	6	0	0	



<i>Valve Type</i>	<i>Set up Number</i>									<i>Base Diagram</i>
4. American 6K8 indirectly heated frequency changer. Octal base.	0	2	7	5	4	6	3	1	0	

#### Provision for New Valve Bases

To cover the possibility of the introduction of new valve bases not provided for on the standard panel and also the introduction of valves which may necessitate special conditions associated with standard valve holders, a plug-in adaptor is available which enables any non-standard valve holder to be combined in this adaptor and plugged into the octal or other suitable base on the Valve Characteristic Panel. These adaptors are available for bases not included on the Valve Panel, and also with a blank valve holder mounting panel in which can be mounted the user's own valve holder if he requires any special arrangement for which we have not catered.

#### The Prevention of Self Oscillation of valves under test

It will be realised that the length of wiring and its associated capacity, connected to the grid and anode pins of any one of the valve holders, can constitute a tuned line corresponding to a high resonant frequency often of the order of 100 megacycles per second or higher. A number of modern valves have sufficiently high slope to overcome the inherent losses associated with such a tuned line, and are, therefore, capable of bursting into oscillation at a frequency determined by the constants of their associated valve holder wiring when being tested at or near their maximum working slope. It is quite obvious that in order to test a valve some wiring must exist between the valve holder and test circuit. Further, since a multiple test panel is desirable to obviate the necessity of a vast number of separate plug-in units, the total amount of wiring associated with any one valve holder must be a considerable number of inches in length. Thus it is almost impossible to increase the effective resonant frequency of the lines thus produced to such a high value that no normal valve will oscillate therewith. The only alternative is to render the line of comparatively high loss and in extreme cases to stopper the valve in question right on top of its anode and/or grid connection. Unfortunately, however, since a very large number of pin combinations have to be accommodated in any one valve holder the presence of such a resistance in say a heater or cathode circuit could give completely erroneous results, and this stoppering system could therefore only be very sparsely used.

In certain circumstances where a newly introduced valve of high efficiency is likely to be tested in any quantity and shows signs of oscillation, the separate valve holder adaptor can be employed with considerable advantage. By this means a valve holder can be stoppered to the maximum extent necessary for the valve in question without reference to any other valves that may be incorporated therein, as when the other types of valves

are likely to be used, the adaptor can be set aside and the valve panel used normally. It must be stressed that this oscillation is unlikely to occur where the valve is tested at anode currents lower than normal, or at a point on its curve which renders its mutual conductance low. Were a purely empirical method of testing employed in the Valve Characteristic Meter, therefore, the problem would in all probability not arise, but since every effort has been made to actually test the valve under its correct operating conditions of current and voltage, then it is on this account working at its normal efficiency and can, unless special precautions are taken, give rise to the oscillation troubles to which we have referred.

Whilst discussing the problem of oscillation, mention should be made of the rectifier (which will be seen in the circuit diagram) included in the screen circuit of pentode and tetrode valves. This rectifier has been incorporated to obviate a difficulty which can arise in certain circumstances when testing valves of the beam tetrode type with alternating current applied to their electrodes. As the applied electrode voltages approach zero during a portion of their operative cycle, the focusing of the beam of such valves is to some extent upset and the result can be that the screen circuit begins to show an emission in a reverse direction from normal screen current with the result that the anode current rises and the current taken by the screen decreases rapidly and becomes negative. This can cause screen overheating and besides giving an unstable and erroneous impression of the condition of the valve, can, if allowed to continue, damage the valve. To obviate this condition, therefore, the rectifier is included in such a manner that only its low forward resistance is presented to the screen passing current in the normal direction, thus causing a negligible variation to standard conditions, but the reverse resistance of the rectifier is operative to limit screen current of the opposite direction to negligible proportions and thus prevent the conditions stated above, from coming into effect.

The problem of self oscillation has been almost completely eliminated in the "AVO" Valve Characteristic Meter Mark II by stoppering the Roller Selector Switch, and wiring the Valve Holder Panel in connection loops of predetermined lengths, so that any valve inserted would tend to oscillate at a definite frequency dependent on the loop lengths. These separate inter-connection loops are then loaded so that oscillation cannot occur when testing valves with conventional characteristics, irrespective of the Valve Holder and pin combination used. In earlier models, every attempt has been made to reduce the possibility of oscillation by the discreet use of stoppers wherever possible and the careful lay out of wiring in cases where it is known that high slope valves are likely to give rise to trouble of this nature.

### Special procedure for Valves having Internally Connected Pins

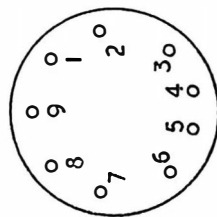
The notes which follow relating to valves having internally connected pins do not apply to the Valve Characteristic Meter Mark II and can be ignored. Here where \* appears in the Selector Switch number, denoting an internal connection, it is merely necessary to set the appropriate Roller to  $\frac{9}{2}$ , e.g. U.81 where the Selector Switch reads \*\*9 \*\*8 230 set the Roller Selector Switch to read 009 008 230 and test as a normal valve.

On certain valves of recent manufacture, particularly the miniature glass type employing B7G, B8A, B9A, etc., bases it has become the practice of manufacturers to connect internally certain of the valve electrodes to pins which would otherwise be blank and free from any connection. Although the manufacturers specify the pins on which this is likely to occur they reserve the right to vary the nature of the internal connections from time to time as prevailing conditions might demand. This in itself prevents the inclusion of the electrode thus internally connected, in the normal selector switch set-up of the valve.

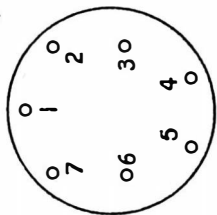
The pins on which this arrangement occurs however, cannot be connected to earth (O) on the roller switch, for this may result in an electrode being shorted to earth with possible damage to the instrument. Therefore, where this possibility is known to exist a symbol "\*" appears in place of the relevant pin connection in the valve set up number, to ensure that the preliminary test for electrode insulation is carefully carried out before normal test procedure is brought into effect.

# DIAGRAM OF STANDARD PIN CONNECTIONS

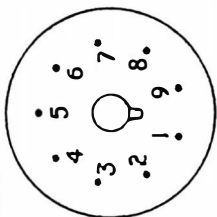
(viewed from underside of base)



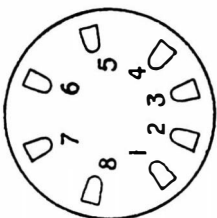
BRITISH NINE PIN (B9)



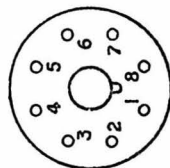
BRITISH SEVEN PIN (B7)



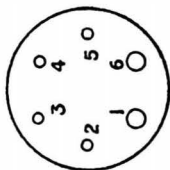
B 9G



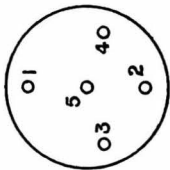
'P' TYPE BASE (8SC)



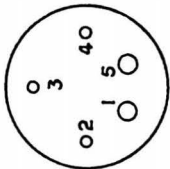
INTERNATIONAL OCTAL (AO8)



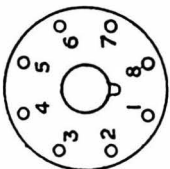
AMERICAN SIX PIN (UX6)



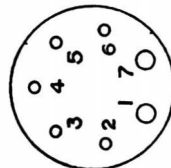
BRITISH 4/5 PIN (B5&B4)



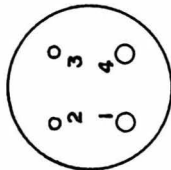
AMERICAN FIVE PIN (UX5)



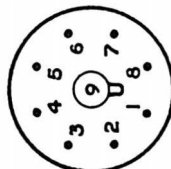
BRITISH OCTAL (MO8)



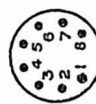
AMERICAN SMALL SEVEN PIN (SM7)



AMERICAN FOUR PIN (UX4)



AMERICAN OCTAL (B8B)



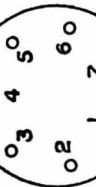
SUB MINIATURE 8 PIN (M8)



HIVAC FOUR PIN (SM4)



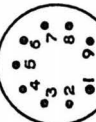
HIVAC FIVE PIN (SM5)



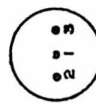
AMERICAN SEVEN PIN (UX7)



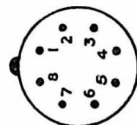
B7G



B9A



B3O



B8A

Where “\*” appears in the set up number substitute  $\frac{1}{C}$  when setting up the selector switch. Before inserting valve, ensure that **Circuit Selector** switch is in position **Check (C)** and apply the normal **Electrode Leakage Test**. This will enable the unknown electrode connection to be obtained as follows :—

- (1) By rotating the **Electrode Leakage** switch, a “short” will appear at the position “C” in addition to one or more other electrode positions, depending on the number of internal connections. If now the rollers associated with the valve pins designated by “\*” ( $\frac{1}{C}$  in the set up) are rotated, the short will be cleared when the roller(s) electrode indication is the same as the electrode to which the pin(s) in question is internally connected. The final set up which clears all shorts will obviously be the correct one for the valves and normal testing can thus proceed.

e.g. if set up reads 41236\*100

Set rollers to read 412361100

On proceeding as above, it is found that a short occurs on “C” and “G” positions of **Electrode Leakage** switch : On rotating roller No. 6 to  $\frac{4}{G}$ , when the set up reads 412364100, the indication of shorts will have been removed and normal test procedure can be followed.

This method will satisfactorily deal with all internal electrode connections (A, S, G, etc.) with the exception of the case where the internal connection is made to a point on the heater (this may be either end or centre tap).

- (2) In such a case, a short will appear at the “C” position of the **Electrode Leakage** switch, but at no other electrode position (as “H” position normally shows short circuit denoting heater continuity). Rotating the corresponding roller in this case will merely change the “short” indication to some other electrode designated by the roller position.

Remove the valve from its socket and carry out a continuity test with an ordinary ohmmeter between the pin on which the unknown connection occurs and all standard pins connected to heater. The ohmmeter must be used on a low enough range to distinguish between “short” and the heater resistance. The point on the heater (H—, H+ or CT) showing zero resistance to the pin in question will now determine the set up number, and the roller must be rotated accordingly.

E.g. If set up is 41236\*100

and on ohmmeter check, zero resistance is shown between pins 6 and 3, set up for all tests will be 412362100.

It should be noted that if after switching to **Check (H)** the indicator lamps are very dim, and valve heater does not light up, it is probable that the valve filament voltage is being shorted out, due to the wrong side of filament voltage being connected to the internal connection pin, and this fault can be cleared by reversing the heater connection to the pin marked “\*.”

- (3) When no indication of electrode leakage, other than normal heater continuity, occurs at any position of **Electrode Leakage** switch, the pin(s) marked “\*” have not been connected internally and normal procedure can be followed in testing the valve.

### THE CONTROLS ON THE FRONT PANEL THEIR FUNCTIONS AND OPERATIONS

All the controls necessary for carrying out the essential valve testing functions are situated on the front panel of the instrument, and by the manipulation of these controls and the use of the valve panel already described, the following tests can be undertaken.

1. The direct indication of insulation resistance between electrodes with the valve cold. This test will also indicate heater continuity.
2. The direct indication of insulation resistance between specific electrodes with the valve filament hot, including a separate test for the important function of cathode to heater insulation.
3. The measurement of mutual conductance directly in milliamperes/volt over a full range of applied high tension and bias voltages.

4. The comparative indication of valve goodness on a coloured scale on the basis of mutual conductance reading.
5. The ability to plot complete sets of mutual characteristics  $I_a/V_{g1}$ ,  $I_a/V_a$ ,  $I_s/V_{g1}$ ,  $I_s/V_s$ , etc., with a complete range of applied electrode voltages corresponding to D.C. operating conditions.
6. The testing of rectifiers under reservoir condenser conditions with a full range of D.C. loading.
7. The testing of signal diodes under suitable D.C. load.
8. The testing of the separate sections of multiple valves, the non-operative section of the valve being maintained at reasonable working electrode voltages.
9. The indication of grid current and valve softness.
10. The possibility of testing valves with suitable loads included in the anode or other required electrode circuit, together with the ability to read the required electrode current on a separate meter of greater sensitivity if desirable, thus rendering the instrument suitable for making tests on non-standard and specialised types of valves not catered for in the normal circuit arrangements.

The separate functions of the controls available are as follows :—

#### **The Set ~ Control.**

This control enables minor adjustments to be made to the inputappings on the mains transformer after the coarse mains tapping has been set.

#### **The Electrode Leakage Switch**

This switch serves the dual purpose of putting the instrument in a condition for the initial setting of the Set ~ control and also indicates the electrodes, if any, between which leakage occurs with the valve in a cold condition. It also serves to indicate heater continuity.

#### **The Circuit Selector Switch**

This is a six position switch enabling the instrument to be set up in readiness for the type of test to be undertaken. All the necessary internal circuit connections are made to satisfy the test conditions required, whilst internal test circuits unnecessary to the measurements in question are automatically removed from the valve.

On position **Check (C)** the instrument is set up for the initial mains voltage adjustment, also on the same position the Tester is suitably connected for the cold electrode leakage test, to which we have already referred.

At the **Check (H)** position of the switch, the valve is automatically tested for electrode leakage, with the heater hot, between the cathode and heater strapped, and all other electrodes.

At position **C/H. ins** the valve is automatically tested for cathode to heater insulation with the valve hot.

With the circuit selector turned to **Test** all normal mutual characteristics are measured in conjunction with the electrode voltage controls, the meter and anode selector switches and other relevant controls. It will be noted that in the case of the insulation tests the meter is automatically shunted to the appropriate sensitivity and the insulation scale can be read directly. On the **Test** position of the **Circuit Selector** switch, however, the meter range selector is brought into circuit, thus enabling the meter range to be suited to the current measurement to be undertaken.

The switch setting **Diode** and **Rec** are for carrying out reservoir load tests on diodes and rectifiers, respectively. In the case of the diode test the **Meter Selector** should be set to the 1mA position, whilst when testing rectifiers the **Meter Selector** is set to a value, on the inner scale, suited to the load on which it is desired the rectifier should be tested.

#### **The Anode and Screen Voltage Switches**

As their names imply these switches enable the requisite electrode voltages to be applied to screens and anodes of valves for the purpose of carrying out mutual characteristic measurements. They are normally calibrated in the equivalent DC voltage settings and, therefore, no account need be taken of the actual value of AC voltage which appears at the electrodes of the valve, which, as already explained, will differ from the equivalent DC value marked at the switch position.



### The Heater Voltage Switches

This dual switch combination is for adjustment of the heater voltage applied to the valve under test. To enable a very wide range of heater voltages to be obtained the settings of the two switches are arranged to be additive. Thus, with the right hand switch set at 0 all useful voltages between 1.1 and 16 can be applied to the valve by the left hand switch, whilst with the right hand switch at any figure above 0 the value indicated on the right hand switch should be added to the indication of the left hand switch. For example, with the left hand switch set at 5 and the right hand switch at 80, the heater voltage applied to the valve will be 85.

### The Negative Grid Voltage Control

A continuously variable control calibrated 0—10 and marked **Neg Grid Volts** enables the initial negative bias at which a test is made, to be set at any value between 0 and — 10 volts, with the bias multiplier switch set at  $V_g \times 1$ . With this switch set at  $V_g \times 10$  the bias range covered by this control is increased to 0—100V negative.

### The Press Buttons

Immediately underneath the movement will be found a row of three buttons marked respectively **Gas**, **Re-Set** and **mA/V**. As their names imply these are for the indication of grid current, the re-setting of the automatic cut-out, and the direct reading of mutual conductance in mA/V after the initial valve test conditions have been set.

The **mA/V** button applies a small supplementary change of grid bias in a positive direction to the grid of the valve after the latter has been correctly set up in accordance with the data given hereafter, or alternatively, with the maker's characteristic details. The initial anode current having been obtained and the meter indication backed off by the backing off control, the pressing of this button will cause a rise in the anode current which will indicate on the appropriate meter scale the mutual conductance of the valve directly in mA/V. This test also serves as a comparison test of valve goodness in conjunction with the coloured meter scale and **Set mA/V** control.

A change in anode current consequent upon the pressing of the **Gas** button will indicate the presence of grid current in the valve, the relative magnitude of which can be assessed from a knowledge of the mutual conductance of the valve and the change in current obtained.

When the presence of a damaging short causes the cut-out to operate, the lamps behind the meter will be extinguished and voltages will be removed from anode and screen circuits of the valve. After having investigated and removed the cause of the short the instrument may be put into operation again by the pressing of the **Re-Set** button, the correct condition being shown by the illumination once again appearing behind the meter scale plate.

The **Set Zero Control** enables an initial anode current reading for the valve to be backed off prior to the taking of mutual conductance readings, the direction of the control being such that an anti-clockwise movement of the knob will cause the meter needle to approach zero.

The **Meter Selector Switch** is a combination switch serving to shunt the meter suitably to the current measurement to be undertaken and also to insert the right value of load when making tests on rectifiers and diodes. It has two sets of calibrations, the outer ring of figures marked 100, 25, 10, 2.5 and mA/V is for use when the current selector is at position **Test**, and serves to indicate the full scale deflection current for the movement in milliamps when taking anode current figures, and similarly represents full scale reading in mA/V when taking mutual conductance figures. The last position marked **mA/V** indicates that the instrument is correctly switched for the use of the **mA/V Control** in conjunction with the coloured comparison scale on the meter.

The inner ring of figures marked 120, 60, 30, 15, 5, 1 represent the load current associated with the coloured scale when taking rectifier tests with the circuit selector on **Rec** or **Diode**. Thus if the valve is rated at say 60 mA per anode, the **Meter Selector Switch** should be turned to "60" on the inner ring of figures and the comparative goodness of the valve with reference to this basic figure will be shown on the coloured scale.

Note that when the **Circuit Selector** switch is set to **Diode** for testing signal diodes, the **Meter Selector** should always be turned to position "1" and the coloured scale then operates with reference to a load current at 1mA, a suitable figure for signal diodes. The 1mA setting of the **Meter Selector** does not apply to rectifier load tests with the **Circuit Selector** switch at **Rec**.

The **Set mA/V Control**, marked 1—15mA/V is for the rapid checking of the operative goodness of a valve on the basis of mutual conductance, after the valve has been set up for normal test, and the anode current backed off to zero. After the **Meter Selector** is turned to position **mA/V**, the **mA/V Control** should be turned to the rated mutual conductance figure for the valve in question. The pressing of the **mA/V** button will now cause the meter needle to rise and its position on the coloured scale will denote operative valve goodness.

The **Anode Selector Switch** marked  $A_1$ ,  $A_2$ , **S**, enables separate tests to be made on multiple valves, and also makes possible the taking of Screen (or  $g_2$ ) characteristics. With this switch turned to " $A_1$ ", the figures of anode current and mutual conductance shown on the meter are relevant to the anode designated on the set up roller by  $A_1$ . As such the switch is in position for measurements on all single electrode system valves (triodes, pentodes, etc.). This position also serves for the first half of double valves (double triodes etc.) and for the triode or pentode section of multiple diode valves (double-diode-triode, etc.). A similar setting of this switch serves for the triode or oscillator section of frequency changers.

With the **Anode Selector** switch at position " $A_2$ ," the indicator meter will show anode current and mutual conductance associated with the second anode of double valves, the mixer anode of frequency changers and all anode systems associated with the set up figure  $A_2$ . In this condition the first anode is not left floating, but has the normal anode volts supplied to it via a limiting resistance.

With the **Anode Selector** set to "**S**", the current meter is inserted in the screen ( $g_2$ ) circuit of valves and screen current will thus be indicated. When making this test, anode voltage is automatically applied to all anodes in the valve. Note that in the case of a double pentode valve, the current indicated will be the combined current of both screens.

When the **Circuit Selector** is switched to position **Rec** and **Diode**, then positions " $A_1$ " and " $A_2$ " of the anode selector switch correspond to diode anode 1, and diode anode 2 respectively, i.e. : to the electrodes associated with the selector switch number  $D_1$  and  $D_2$ .

### The Special Adjustment Panel at the rear of Instrument

This will be uncovered by the removable plate at the back of the instrument and the following will be exposed to view.

- The coarse setting for the applied 50/60 ~ mains voltage marked 100/115, 200/215, 220/230, 240/250, the setting being made by means of the plug on this small sub-board, to the tapping most nearly corresponding to the nominal mains voltage.
- The fuse holder cap which may be unscrewed revealing a small cartridge fuse which may be thus easily replaced if blown. The correct value for this fuse is 2.5 amp.
- The link shorting out two sockets for the insertion of resistance, meter or other load in the anode circuit.

### GENERAL PROCEDURE FOR TESTING A VALVE

- After having set the coarse mains voltage plug at the rear of the instrument to suit the supply voltage, connect mains lead to supply noting that red and black leads are live and neutral. The green or yellow lead is the earth connection. Switch on and note that illumination appears behind the transparent meter scale. The valve to be tested should *not* be inserted at this stage.

- Turn the **Circuit Selector** switch to position **Check (C)** and **Electrode Leakage** switch to position "~." The instrument needle should now rise and assume a position near the black region of the insulation scale denoting zero ohms. Rotate the **Set ~** control

until the meter needle assumes its nearest point to the red line in the middle of this black scale marking. With a correct settings of the initial mains voltage adjustment rotation of the **Set  $\sim$**  control should enable the needle to be moved on either side of the red arrow. If this is not the case and rotation of the **Set  $\sim$**  control does not enable the needle to reach its setting mark from either direction, then the initial mains setting should be moved to the next appropriate tapping. This tapping should be higher than the one chosen if the needle always appears to the right of the red mark and lower if to the left.

3. Having set up the accuracy of the instrument to conform to the applied mains voltage, refer to the AVO Valve Data, or alternatively to the maker's characteristic data for the valve and set up the appropriate valve holder connections on the Valve Panel selector switch as already explained.

Set the heater voltage switch to its correct value for the valve and insert it in the appropriate valve holder, without moving the **Circuit Selector** switch from its position **Check (C)**. Rotate the **Electrode Leakage** switch through its various electrode positions starting with the extreme counter clockwise position marked "H". At position "H" the meter should show a short, thus indicating heater continuity. Thereafter any reading obtained on the insulation scale of the meter will show an electrode insulation breakdown corresponding to the electrode indicated by the **Electrode Leakage** switch setting. (Thus a reading on the meter of 1 megohm when the **Electrode Leakage** switch is set to position "G<sub>1</sub>" and position "S" will indicate that a cold insulation breakdown of 1 megohm is occurring between the grid and screen electrodes of the valve.) It will be noted that wherever electrode leakage occurs, indication of this will be shown at two positions of the **Electrode Leakage** switch, because, obviously, leakage must occur between two points. In the case of breakdown to heater from any other electrode, such leakage indication will only occur at one switch setting subsequent to the initial selector setting, which should automatically show zero ohms to denote heater continuity.

4. Having ensured that no cold leakage path of any magnitude is present in the valve to be tested turn the **Circuit Selector** switch to **Check (H)**. Allow a few moments for the valve heater to warm up and note if any meter deflection occurs. Such a deflection would denote in megohms the amount of insulation breakdown that occurs between cathode and heater strapped and all other electrodes of the valve when heater voltage is applied. Note that if, for any reason, the **Circuit Selector** switch is turned back to **Check (C)** there will, in all probability, be an indication of an apparent cold electrode insulation breakdown between a number of the valve electrodes. This need not be the cause and the reading will be found generally to disappear after a few moments. The reason for such an indication is obvious when it is realised that the valve cathode has been heated during the **Check (H)** test. When returning to the **Check (C)** position, therefore, the cathode is hot and still emitting. What appears to be a temporary electrode breakdown, therefore, is in fact the indication of emission which disappears as the heater or cathode cools.

5. Turn **Circuit Selector** switch to **C/H. ins** when any cathode to heater insulation breakdown which occurs with the heater hot will be shown on the insulation resistance scale of the meter. No set rule for the rejection of a valve on this score can be laid down, but it will be realised that in many circuits where an appreciable potential exists between heater and cathode such as, for instance, in cathode follower circuits or DC valve amplifiers, the presence of a heater to cathode breakdown of the order of megohms can often give rise to quite serious trouble. Heater to cathode insulation breakdown, either permanent or variable, can also give rise to noise in valve amplifier circuits. If, on the other hand, the value of cathode to heater circuit resistance is only of the order of a few hundred ohms, as for instance where cathode biasing is used with high slope valves, then a cathode to heater insulation breakdown of the order of fractions of a megohm need not give rise to any serious trouble.

6. The next test normally to be made upon the valve is the measurement of some or all of its mutual characteristics. This may take the form of the complete plotting of one or all of its characteristics, or the measurement of its mutual conductance, or the comparative testing of the valve on the basis of its mutual conductance. All these require the manipulation of the main voltage and meter controls and, before such a test is under-

taken and the **Circuit Selector** switch turned to position **Test**, one should be assured that all the requisite controls are correctly set. This applies to the setting of the anode, screen and grid voltage controls, the **Meter Selector** and the **Anode Selector** switches. *In particular, where the probable anode current of the valve is unknown, the Meter Selector should be set to 100mA to avoid damage to the movement, if the current flowing is such as to be considerably higher than that catered for by the lower meter range positions.* It is always perfectly simple and safe to set the **Meter Selector** at successively lower full scale current deflections to cater for a valve, the anode current of which is less than that which can be appropriately read on a higher range. If the reverse procedure is adopted, however, then it is quite possible that a damaging current may have passed through the meter circuit before the latter is set to a suitable high range. The procedure for taking the necessary valve measurements is then almost self explanatory.

Where only a measurement of mutual conductance is required then the data for this can be taken from this book. The electrode voltage settings should be made as indicated and consequent upon such settings an initial anode current will be shown on the meter which has been finally set to a suitable range. This anode current reading should normally be compared with the anode current reading shown in the tables, as it will give an initial indication of the valve "goodness". Quite obviously if a valve shows an anode current reading considerably below that which is appropriate for the applied electrode voltages, then its emission is much lower than would normally be expected and in normal circumstances the valve will not function at full efficiency. More particularly does this apply in the case of valves used either as oscillators or output valves, for in both conditions the valve has to deliver an appreciable power which cannot obviously be up to standard if the emission is low. At the same time care should be taken not to jump to false conclusions on this basis when testing valves of very high slope and short grid base, where it may be possible to double the valve anode current for a change in bias of some  $\cdot 25V$ , and a very slight variation in the valve characteristics may give rise to an erroneous impression of the valve's "goodness" on the score of anode current. After having obtained the initial anode current reading and obtained therefrom such information as is desirable, this anode current indication may now be backed off to zero by the **Set Zero** control and the **Meter Selector** switch re-set to a range appropriate to the expected reading of mutual conductance. By pressing the **mA/V** button the mutual conductance of the valve will then be directly indicated on the meter, the reading in milliamps obtained being indicative of the mutual conductance in **mA/V**.

Alternatively, where it is not necessarily required to obtain a precise reading of mutual conductance, but merely a gauge of the valve's goodness factor on the basis of mutual conductance, then after backing off to zero the **Meter Selector** should be set to position **mA/V** and the **Set mA/V** control set to a value corresponding to the standard mutual conductance reading for the valve. On pressing the **mA/V** button the comparative goodness of the valve will then be shown on the coloured scale which is divided in three coloured bands. All valves coming within the green portion can be taken as satisfactory. Valves in the red portion are suitable for rejection, whilst the small intermediate band between the green and red portions denotes a valve which, whilst not entirely unsatisfactory, is not by any means working at its full rated efficiency. Subsequent action on the valves whose test figures come within this band will obviously have to be related to the particular requirement of the moment.

Where more comprehensive tests of the valve are required, to assist in the solution of development or more intricate test problems, the plotting of one or a family of mutual characteristics can often give a much more complete answer. This may readily be undertaken with the **Valve Characteristic Meter** and is performed with the **Circuit Selector** in its position **Test**. The manipulation of the controls subsequent to the obtaining of the initial anode current readings is not of course required, it being merely necessary to plot the value of the appropriate electrode currents as read from the meter, against the settings of the associated electrode voltage switches.  $I_a/V_{g_1}$  curves will be taken at a pre-determined setting of anode and/or screen volts, the reading of the anode current obtained being plotted against the settings on the variable grid bias control. Similarly

Ia/Va curves will require a fixed setting of grid bias, anode current being plotted against the settings of the anode voltage switch.

Where either mutual conductance characteristic curves are required for the screen or  $g_2$  of the valve in question, then the **Anode Selector** switch should be set to position "S", the meter current shown will be an indication of the screen (or  $g_2$ ) current and all the above instructions can be related thereto.

Remarks in relation to the tests described above as applied to multiple or special types of valve, will be found in subsequent test notes.

7. Where a valve is suspected of passing too much grid current, a measure of the magnitude of grid current at the desired conditions of applied electrode voltage may be made after having measured the mutual conductance of the valve in question. After having set the valve up and backed off the anode current to zero as for mA/V test, the button marked **Gas** should be pressed. Any grid current flowing will set up a DC grid voltage across the 100,000  $\Omega$  resistance introduced into circuit. This will result in a change in anode current (usually forward) dependent upon the polarity of the voltage developed across the resistor. The value of the grid current flowing will then be calculated from the formula

$$I_g (\mu A) = \frac{\Delta I_a \times 10}{g}$$

where  $\Delta I_a$  is the anode current change, and  $g$  is the mutual conductance in mA/V. The direction of anode current change will denote the nature of the grid current flowing.

8. The testing of rectifying valves should really be associated with the requirements of the circuit in which these valves are to work, although in most cases, in the data for the valve in question a figure is quoted denoting the standard emission to be expected for a valve of the type under test. The procedure for carrying out the test is again straightforward. All initial tests should have been carried out as for amplifying valves, but instead of setting **Circuit Selector to Test** for the measurement of mutual characteristics, the circuit selector should be set to position **Rec.** after having turned the **Meter Selector** to a load current range appropriate to the valve. This load current, it will be realised, applies to one anode only. The setting of load current can either be determined from the tabulated data as already mentioned, or alternatively can be related to the total current that the valve is required to deliver. Thus in a piece of apparatus where the total HT current drawn is say 50mA, then a rectifier load current setting of "60" will be an adequate test for the valve emission (assuming half wave rectification.)

Alternatively, if the valve is a new one, the maker's rating for maximum load current can be used as the basis for the setting of the meter range switch. It will be realised that since each half of a full wave valve is tested independently, then the setting of the range switch should indicate half the total value of current that the valve would be expected to deliver in a full wave circuit. For instance a valve rated at a maximum current of 120mA would be tested with each anode at the "60" position on the **Meter Selector**. No further manipulation of the electrode voltage controls is required. The heater voltage is already set whilst anode, grid and screen voltage controls are completely dis-associated from the test circuit by the setting of the **Circuit Selector** switch to **Rec.** all appropriate voltage and circuit connections also being automatically made. Having, therefore, correctly set up the valve as explained, the indication of the meter needle on the coloured scale will show the operative goodness of the valve in relation to the standard load current chosen.

Similar remarks apply to the testing of signal diode valves, with the exception that these are always tested with the **Meter Selector** at "1" and the **Circuit Selector** at position **Diode**.

### INSTRUCTIONS FOR TESTING SPECIFIC VALVE TYPES

The function of a valve, as distinct from its manufacturer's type number is indicated by a symbol in the form of letters appearing at the extreme right of the test data ; thus a half wave rectifier would have the letter "R" in the function column, whilst a full wave rectifier would be designated by "RR". Similarly, diode valves will be shown by the letter "D" the number of diode elements being indicated by the number of "Ds", thus "DDD" refer to a triple diode.



The testing of *multiple diodes or rectifiers* is carried out in the manner already explained, the **Anode Selector** switch being used to select the diode or rectifier element, the emission figure for which, being indicated on the meter. It will be realised that when dealing with diodes or rectifiers  $A_1$  and  $A_2$  positions of the selector switch represent diode or rectifier anodes 1 and 2 respectively and correspond to figures 8 and 9 in the set up figure.

In the case of **triple diodes** since only two anode systems are normally catered for, a special procedure is adopted in the set up figure. At the position in the set up number representing the third diode the symbol † is included, the first and second diodes being indicated by 8 and 9 respectively in the normal way. The valve should now be tested normally with the selector switch set to 0 where the † appears in the set up number. This will give emission figures for diodes 1 and 2. Now rotate the **Selector Switch** rollers so that the two rollers originally set at 8 and 9 are now set to 0 and set up the position † as 8 on the selector switch. A further test with the anode selector switch at  $A_1$  will thus give the emission of the third diode, e.g., AAB1 will be indicated in the data as 0231†0980. To test diodes 1 and 2 the set up on the roller switch will be 023100980 and diodes 1 and 2 will be tested in the normal manner. For obtaining the emission figure for the third diode the **Selector Switch** will be altered to 023180000 and the **Anode Selector** to position  $A_1$ .

**Double Triodes or Double Pentodes** will be indicated by the letters "TT" or "PP" in the type column and will be tested in the normal way for each half of the valve, selection being made by the rotation of the **Anode Selector** switch to  $A_1$  or  $A_2$  corresponding to set up figures 6 and 7.

**Combined Diode and Amplifying Valves** will be represented in the type columns by "DT" and "DDT" for diode triodes and double diode triodes, whilst "DP" and "DDP" indicate diode pentodes and double diode pentodes. The testing of such valves is automatic, the amplifying section being tested first with the **Circuit Selector** switch at position **Test** and the **Anode Selector** at position " $A_1$ " whilst the rotation of the **Circuit Selector** switch to the **Diode** position will automatically set the instrument in readiness for testing one or both the diodes with the anode selector at  $A_1$  or  $A_2$  respectively, with the **Meter Selector** set to "1".

**Frequency Changers of the Heptode, Hexode** class employing the normal oscillator section as a phantom cathode for the mixer section are not very satisfactorily tested in two Sections, as the nature of the valve construction is such that each section is dependent on the other for its correct operation. For test purposes therefore, this valve is shown connected as an HF pentode for which, where possible, anode current and/or mutual conductance figures are given. Such valves are indicated by the letters "H" in the type column.

An exception to this class of valve is the **Octode** designated by "0" in the type column which, as will be seen from the data, is tested as if it had two separate electrode assemblies, separate data being given for each. In this case the oscillator section is tested with anode selector at  $A_1$  and the mixer section at  $A_2$ .

As a further test to ensure the probability of such a valve oscillating satisfactorily, an indication of failing emission will possibly give the most useful results. It will be realised that when a valve is up to standard its cathode will develop its full emission at the rated heater voltage for the valve, and any change in the cathode temperature will not result in a corresponding change in the emission. If, however, the cathode's emission is failing, then an increase or decrease in the cathode temperature will result in a noticeable change in the emission for the valve. When a valve is oscillating it tends to run into the positive grid region, and thus makes use of the full emission capabilities of the cathode. Any failing emission will limit its utility in this respect. As a subsequent test, therefore, on a valve designed to be used as an oscillator, it is helpful to note the anode current at the rated test figures with the normal heater voltage applied and then decrease the heater voltage by about 10 to 15% (the next tapping on the selector switch) for a short period. In the case of a valve with failing emission this will result in an excessive decrease in the anode current considerably greater than the percentage decrease in heater volts. Such a result would suggest that the valve will not oscillate very satisfactorily. A negligible or small decrease in anode

current (or of the same order as the heater volts change) will show that the valve is developing its full emission at the rated heater voltage, and provided that the circuit conditions are right it should oscillate normally.

**Frequency Changers** employing separate electrode assemblies for oscillator and mixer functions are designated by "TH" (Triode Hexode) "TP" (Triode Pentode). The separate sections of this valve are not interdependent, as in the case of the phantom cathode types, and they can thus be tested in two separate sections as a pentode or triode respectively. This arrangement is catered for in the set-up figures given, 6 corresponding to the triode section and tested with the **Anode Selector** at  $A_1$  whilst 7 in the set up figure corresponds to the mixer section which is tested with the **Anode Selector** at  $A_2$ . The figures to be expected from both halves of the valve are given in the tables where available, but it is often informative to apply a test for failing cathode emission to the triode or oscillator section in the manner already described.

In the case of normal triodes and pentodes (including beam tetrodes) the test procedure for which has already been fully outlined, the type column will show the symbol "T" and "P" respectively.

### THE USE OF THE LINK ON THE BACK PANEL OF THE INSTRUMENT.

This link is to enable a load to be inserted into the anode circuit of the valve under test when an anode current or mutual conductance test is being performed on the electrode circuit in question. It thus enables dynamic figures for the valve or electrode system concerned to be obtained, the procedure being to remove the shorting link and insert across the sockets a resistance or other load which it is desired to include in circuit.

**Tuning indicators (Magic Eyes)** are tested with the controls set according to the figures given in the separate data table, using the screen switch for obtaining target voltage and inserting the anode load, shown in columns marked "Ra" by means of the link at the rear of the instrument. At the approximate bias given in the table the triode section should be at cut-off and the "eye" fully closed. On varying the grid bias to zero the "eye" should open fully and the value of anode current should be approximately that appearing in the table. In the case of double sensitivity indicators giving multiple images responding to different sensitivities, two sets of data (where possible) are given, the first set referring to the more sensitive indication.

#### **Gaseous Rectifiers**

These also necessitate the use of the link, as such valves would normally pass a damaging current if tested without suitable limiting load in the anode circuit. They are, therefore, tested not on the rectifier or diode test circuit, but with the selector switch turned to **Test**, anode voltage and representative anode current figures being given in the **Valve Data** columns. The value of load resistance (of suitable wattage) which must be included across the link, before the valve is tested, is shown in  $K \Omega$  in the "mA/V" column (which would not normally apply to a rectifier valve). Full wave examples of this class of valve are of course tested at anode selector switch positions  $A_1$  and  $A_2$ .

**Cold Cathode Rectifiers** designated by the symbol "CCR" can be tested in a similar manner, the anode voltage, approximate anode current, and load resistance being given in the data columns as above.

**Thyratrons** can be checked by comparison if set up as a normal triode, with a limiting resistance included in the link, the control ratio being indicated by a comparison between the peak value of the applied anode voltage, and the setting of the grid bias control which will prevent the valve striking and passing anode current. It must be emphasised, however, that the main value of such a test is in comparison only, as the hold off grid bias value shown on the grid bias control is only approximately half that of the bias which would normally be required to hold off the anode current of the valve at the peak anode voltage in question.

**Neon Indicators** may be tested for striking, by setting up the roller switch so that anode and cathode pins of the tube are set to 6 and 1 respectively, all other rollers being connected to 0. A suitable load resistance (normally between 5,000 and 15,000 ohms) should be included in the anode circuit link and the anode voltage switch should be set to a

peak value as near as possible to (and in no cases lower than) the striking voltage of the neon in question. The striking of the neon will, of course, be indicated by a passage of anode current shown on the meter which should be set at a suitably high current range. It should be noted that where the anode voltage refers to the peak applied voltage, as in the case of thyratrons and neons, the actual peak voltage applied to the valve is higher than the indication on the anode voltage switch. To obtain the peak voltage equivalent to a given setting of the anode voltage switch the figure shown on the switch should be multiplied by approximately 1.5 ; thus with the anode voltage switch set to represent a DC voltage of 100V. the peak applied voltage is approximately 150V.

## GENERAL PRECAUTIONS TO BE OBSERVED WHEN USING THE VALVE CHARACTERISTIC METER

It will be realised that when dealing with an instrument such as the Valve Characteristic Meter with such flexibility of control, it is almost impossible to protect the instrument to such an extent that the operator cannot cause damage to either the valve or the instrument by some combination or wrong setting of the controls or incorrect use of the meter. It is, therefore, important that the correct procedure, as previously outlined, should be used in the sequence of the tests applied. Valves should be tested for insulation or breakdown before full voltages are applied for characteristic tests. Where any doubt whatever exists as to the probable electrode current likely to be passed, the Meter Selector switch should always be turned to its highest current range and then gradually reduced in order to facilitate reading of the current.

In experimental work where a variable voltage is required to be supplied to the anode or screen electrodes of the valve, always start with the lower voltageappings and increase only after correct adjustments have been made to the meter selector circuit to ensure that the meter circuit is not thus overloaded by an unknown current. Always make sure that the selector voltage switches have been correctly set for the valve before the instrument is switched on. In this respect it is a good practice to return the selector voltage switches to zero (particularly Heater Voltage switches) after a test has been applied and before a new valve is inserted.

Take care in setting the selector switch to avoid wrongly connecting the electrodes of the valve under test. In this respect the automatic cut-out is advantageous in that it will usually save a valve if high tension voltage is inadvertently applied to the heater by incorrect setting of the switch, but it must be pointed out that after the switch is correctly set *nothing can save the heater from being burnt out if an overload heater voltage is applied by wrong setting of the heater voltage switches.*

Do not apply test voltages to the valve without ensuring that where necessary top cap connections have been correctly made, as a valve can often be irreparably damaged by running it with its grid or its anode wrongly connected.

Where a valve appears to be performing abnormally, as indicated for instance by a continuously rising or falling anode current which does not attain a condition of stability, do not leave the valve "cooking" for a long period to see what will ultimately happen, as this will in all probability result in the damaging of the valve due to excessive currents in the anode or screen circuits. In general, it is not necessary or helpful to leave a valve on test for a considerably longer period than is necessary to complete the test in question.

Finally, it must be stressed that whilst every care has been taken in the compilation of this very large and comprehensive manual to ensure that all data given is correct as far as is known at the time of going to press, it is not impossible that with the many thousands of figures involved, errors will have crept in. The manufacturers cannot hold themselves responsible for any damage that might occur to a valve or to the instrument from such a cause.

## ARRANGEMENTS FOR THE SUPPLY OF ADDITIONAL VALVE DATA

Additional characteristic data will be compiled for the benefit of the users of this instrument as and when it becomes available. This data will be presented in the form of supplementary data slips which can easily be fixed on the blank pages provided opposite each printed data page. New valves can thus be inserted in their right sequence immediately adjacent to valves of similar alphabetical or numerical identification. At the same time it is more than possible that users will find new types of valves before the data for such valves has been printed by us, as it will be realised that it is not in any way economic to reproduce such data until sufficient new valves have come into circulation to make the data sheets worthwhile. In such cases the user may easily set up and test his new valves by making use of the procedure fully outlined in the previous pages and obtain his set up data from the manufacturer's leaflet or valve characteristic booklet.

See application form covering a free information service opposite page 32.

## NOTES ON SIMPLE MAINTENANCE OF INSTRUMENT

If on switching on the instrument and performing the usual test for applied mains voltage, the meter needle does not indicate, and the lamps behind the movement do not light, then it can be assumed that the cut-out has operated. This can have been caused by either an internal or external short circuit that has occurred previously to switching on, or by a sharp mechanical shock that can have jolted the relay.

Alternatively, the fuse may have blown.

First remove the mains plug and check the fuse for continuity and if necessary replace with Belling Lee type L.562/2.5 rated at 2.5 amps. Then replace the mains plug and re-set the cut-out. If the cut-out again blows, examine for an external short on the top panel. Failure due to an internal short circuit should be reported to the Company.

If the lamps do not light but the test for mains voltage shows a normal deflection, then one or both the lamps (they are in series) may have been blown. They should be removed after having removed the mains plug by withdrawing the mounting bracket through the aperture in the rear of the instrument and faulty lamps replaced with Osram type 6.5 volt 0.3 amp S.E.S. fitting (or equivalent).

It is highly probable that due to variations in manufacture, a number of valves will show test figures differing widely from their normal ratings. If, however, all valves appear to be reading consistently low or high by a large percentage then it is probable that either the applied voltages or the movement sensitivity are at fault.

These can be checked without opening the instrument, as follows:—

First check the grid volts between the grid and cathode sockets of a valveholder using an electronic or other D.C. voltmeter imposing negligible load. Then with any given setting of the grid voltage control, the mean D.C. reading obtained between grid and cathode sockets should be  $0.52 \times$  the nominal setting of the grid control and this should be maintained over the full span of the control.

Thus with the control set at — 6 volts, the valve voltmeter reading should be — 3.12V mean D.C., from grid to cathode.

Similarly, the pressing of the button marked mA/V should result in a positive voltage change of 0.52V DC.

Thus with the grid voltage set as above and the button pressed, the valve voltmeter should read — 2.6V i.e.  $(-3.12 + 0.52)$ .

Similarly, the applied anode and screen voltages may be checked by taking a reading between anode (or screen) and cathode sockets of a suitably set up valve holder with an ordinary AC voltmeter. These can be compared with the appropriate anode or screen voltage switch setting as follows:—

$$\text{Nominal voltage (D.C.) setting of switch} = \frac{\text{AC voltage apparent at Valve Holder}}{1.1}$$

Finally the accuracy of the movement may be checked by inserting a valve in the Valve Characteristic Meter correctly set up for test and introducing a suitable multirange DC milliammeter across the link on the back panel. On switching on, the current reading obtained on the Valve Characteristic movement (read in conjunction with the meter range switch) should be exactly twice the current reading on a suitable range of the milliammeter inserted into the link.

If any or all of the above relationships do not hold good after mains voltage has been correctly set, the following procedure should be adopted.

- (a) If anode or screen volts do not come within approximately  $\pm 5\%$  (allowing for any possible error in the meter. N.B.—BS 1 allows  $\pm 3\frac{1}{2}\%$  of f.s.d.) of the required relationship, consult manufacturer.
- (b) If variable grid voltage does not compare with correct V.V. reading :—Remove case of instrument and adjust control marked V.G. on small sub-panel on frame of instrument.
- (c) If a wrong voltage change is obtained when pressing button marked mA/V—adjust pre-set control marked G.M. until correct change obtained.
- (d) Wrong relationship between panel movement and external milliammeter—adjust pre-set control marked “S”.

When making test measurements as described above, it is of course essential for the user to assure himself that he is not misinformed as to the accuracy of his Valve Characteristic Meter by the use of unsuitable or inaccurate external test instruments. Thus when measuring grid volts, the DC Valve Voltmeter used should have an input resistance of at least 100 times the internal resistance of the grid voltage circuit (which is 20,000 $\Omega$ ), whilst when checking for accuracy of screen voltages, it must be remembered that a subsidiary rectifier (see page 12) is always in circuit, and thus an AC Voltmeter having a resistance not less than 1,000  $\Omega$  per volt should be used. The accuracy of all similar measurements should be related to the probable error in the measuring instrument which should of course always be high grade.

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Enclosed within this publication will be found a quick reference guide to the operation of the Valve Characteristic Meter which is intended only to be used once the instructions within this book have been assimilated.

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## CIVILIAN EQUIVALENTS OF SERVICE TYPES

Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
AR4	PMIHF	ARP38	KTZ73	CVI36	7D9	CV504	6U5
AR5	P220	ARS7	VS24	CVI38	EF9I	CV509	6V6G
AR6	LP2	ARS8	PMI2V	CVI40	6AL5	CV510	6V6
AR7	4DI	ARTH2	ECH35	CVI71	W2I	CV511	6V6
AR8	HL23DD	ARTPI	TP22	CVI77	8I3	CV512	6W7
AR9	PMILF	ARTP2	TP25	CVI81	ECC32	CV515	6Y6
AR10	TDD2A	AT20	MZ05/20	CVI82	EI488	CV517	0Z4A
AR11	4019B	ATS25	807	CVI85	PM202	CV518	AC/VPI
AR12	KCI	ATP4	V248A	CVI87	UI9	CV519	Pen 4DD
AR13	B406	ATP5	V245	CV201	V630	CV520	VP2B
AR14	220RC	ATP7	V266	CV207	AC/P4	CV522	7B7
AR15	220LF	ATP10	4061A	CV222	EI489	CV523	12Y4
AR16	220B	ATP35	PVI-35	CV235	U23	CV524	TT12
AR17	MH4	AUI	UI8	CV243	4045A	CV525	12A6
AR20	4021B	AU2	RG250	CV244	AF2	CV526	12A6
AR21	EBC33	AU3	UI2/14	CV245	4328D	CV529	12AH7
ARD2	DI	AU3A	I56I	CV249	4019A	CV531	12C8
ARD4	D42	AU4	UI7	CV260	SP6I	CV534	12J5
ARDDI	I0DI	AU5	VI907	CV266	EI336	CV535	12J5
ARDD3	6H6	AU6	GU50	CV278	EI606	CV537	12SA7
ARDD5	EB34	AU8	U22	CV281	X6I	CV538	12SA7
ARHI	6L7	AUI2	UI5	CV283	6AL5	CV540	12SC7
ARPI	PT2	AUI3	5Z4	CV302	ECH22	CV543	12SK7
ARP2	SP2	AW5	ME4I	CV303	EF22	CV544	12SK7
ARP3	9D2	AW6	EM3I	CV304	EL22	CV545	ACSP3
ARP4	SP210	CVI	DC5I	CV305	EF5I	CV546	12SQ7
ARP5	VP2	CV4	EI229	CV309	QV04-7	CV547	12SQ7
ARP6	SP4	CV5	CVI52	CV321	KT66	CV548	LP2
ARP7	42MPT	CV6	EI148	CV324	CVI628	CV549	25A6
ARP8	AC4Pen	CV8	EI356	CV327	EF52	CV550	25A6
ARP9	Pen1340	CV9	AL60	CV344	EI323	CV551	25L6
ARP9A	7D8	CVI8	DET19	CV345	12EI	CV552	25L6
ARPI0	PenA4	CV20	VI906	CV346	EZ22	CV553	25L6
ARPI1	TSP4	CV21	VP4I	CV347	EBC2I	CV554	D63
ARPI2	VP23	CV24	HL4I	CV352	EBC33	CV555	25Z5
ARPI3	VP210	CV26	8I3	CV358	EF37	CV556	QP25
ARPI4	220IPT	CV31	U20	CV375	EA50	CV557	D42
ARPI5	KTW63	CV33	4077A	CV380	EF54	CV558	25Z6
ARPI6	6J7	CV51	EI320	CV394	EM34	CV559	25Z6
ARPI7	6F6	CV54	V960	CV423	25SN7	CV560	TSP4
ARPI8	KT24	CV63	EI323	CV426	EY5I	CV561	35L6
ARPI9	SP4I	CV65	Pen25	CV430	29CI	CV562	35L6
ARP20	SP42	CV66	RL37	CV437	KT67	CV563	DA30
ARP21	Z62	CV72	VI120	CV450	EL38	CV564	35Z3
ARP22	116/Pen	CV73	VI120B	CV452	6AT6	CV565	35Z3
ARP23	MS/Pen	CV78	EI137	CV453	6BE6	CV567	35Z5
ARP24	220VPT	CV84	4033A	CV454	6BA6	CV568	35Z5
ARP25	KT4I	CVI18	SP6I	CV455	12AT7	CV569	ECC35
ARP26	KT44	CVI21	VI920	CV491	12AU7	CV571	50L6
ARP33	MSP4	CVI22	EI336	CV492	12AX7	CV572	6X5
ARP34	EF39	CVI24	807	CV493	6X4	CV573	6X5
ARP35	EF50	CVI28	SU750	CV500	6T7	CV574	6X5
ARP36	SP6I	CVI31	9D6	CV501	EBF32	CV575	5U4
ARP37	QP25	CVI33	6C4	CV503	5W4	CV578	6A8



Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
CV579	6A8	CV687	446B	CV792	2C22	CV880	7B5
CV580	6A8	CV688	2C43	CV794	2D2	CV881	7B5
CV581	6C5	CV692	0Z4	CV795	2D4A	CV882	7B6
CV582	6C5	CV694	12SG7	CV796	2D13C	CV883	7B8
CV583	6C5	CV697	12SJ7	CV802	2C26	CV885	7C5
CV585	6C6	CV698	12SJ7	CV803	2V3	CV886	7C5
CV586	EL37	CV700	12SR7	CV804	2V3	CV887	7C6
CV587	6Q7	CV703	12K8	CV805	50Y6	CV888	7D7
CV588	6Q7	CV705	1D5GP	CV807	3A4	CV889	7D8
CV589	6Q7	CV706	6U7	CV808	3A5	CV890	7E5
CV590	6SJ7	CV709	72	CV811	1291	CV891	7E6
CV591	6SJ7	CV711	32	CV812	3B24	CV892	7E7
CV592	6SJ7	CV712	38	CV815	3D6	CV893	7F7
CV593	GZ32	CV716	8013A	CV818	3Q4	CV894	7G7
CV594	6SH7	CV717	5R4GY	CV819	3Q5	CV895	7H7
CV595	6SH7	CV723	1619	CV820	3S4	CV896	7K7
CV597	2X2A	CV724	816	CV824	4THA	CV897	7J7
CV599	1851	CV726	35Z3	CV825	4SHA	CV898	7N7
CV603	10	CV728	1P5GT	CV826	4THA	CV899	7Q7
CV604	30	CV729	5V4	CV828	4TPB	CV900	7R7
CV606	37	CV730	6A3	CV829	4TPB	CV901	7Y4
CV608	41	CV731	6F6	CV830	4TSP	CV902	7W7
CV609	42	CV747	6AC7	CV833	89	CV908	12A5
CV610	45	CV750	01A	CV837	12C8	CV909	12A7
CV611	56	CV753	1A3	CV841	5U4	CV910	12A8
CV612	57	CV754	1A4P	CV842	5W4	CV911	12B8
CV613	58	CV755	1A5	CV843	6AB5	CV916	12H6
CV614	75	CV756	1A5	CV844	6AC5	CV917	12J7
CV615	76	CV757	1A6	CV845	6AC5	CV918	12K7
CV616	77	CV758	1B4P	CV846	6AC7	CV919	12SF5
CV617	80	CV759	1B5	CV847	6AF5	CV920	12SF5
CV618	83	CV760	1B7	CV848	6AG5	CV921	12SF7
CV619	84	CV764	1D5	CV849	6AC7	CV922	12SH7
CV624	804	CV765	1D7	CV850	6AK5	CV923	12SJ7
CV629	814	CV766	1E5GP	CV851	6B4	CV924	12SL7
CV631	828	CV767	1F4	CV852	6C4	CV925	12SN7
CV636	836	CV768	1F5G	CV854	6C7	CV927	12Z3
CV637	837	CV769	1F6	CV856	6G8	CV929	13SPA
CV642	872A	CV770	1F7	CV858	6J6	CV930	14F7
CV649	956	CV771	1G5	CV859	6J8	CV931	15
CV650	958	CV772	1G6	CV860	6K5	CV932	2C40
CV652	1603	CV773	1G6	CV861	6K5	CV934	15R
CV653	1611	CV774	1H4	CV862	6L5	CV936	24A
CV654	1612	CV775	1LA6	CV864	6P7	CV937	25A7
CV655	1613	CV776	1LB4	CV865	6SD7	CV938	25AC5
CV656	1616	CV777	1LC5	CV866	6SJ7Y	CV939	25B6
CV657	1620	CV778	1LC6	CV867	6SR7	CV940	25B8
CV658	1622	CV779	1LD5	CV870	6V7	CV942	25Y5
CV659	1625	CV780	1LH4	CV871	6Z5	CV943	26
CV660	6AC7	CV781	1LN5	CV872	6Z7	CV944	27
CV661	6AB7	CV782	1R5	CV873	6ZY5	CV945	28D7
CV664	9002	CV783	1S4	CV875	1642	CV946	28D7
CV665	9003	CV784	1S5	CV876	7A6	CV947	31
CV666	9004	CV785	1T4	CV877	7A7	CV948	32L7
CV667	9005	CV786	1T5	CV878	7A8	CV949	33
CV684	274B	CV787	2A7	CV879	7B4	CV995	6AJ5

Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
CV996	EL32	CVI095	954	CVI178	DA30	CVI316	4021B
CVI000	4DI	CVI099	X66	CVI179	ML4	CVI318	VS24
CVI001	SU2150A	CVI100	KTW62	CVI180	244V	CVI319	PM12V
CVI002	EI192	CVI101	MHLD6	CVI181	KT4I	CVI320	SP2
CVI018	21SSG	CVI102	BL63	CVI182	H42	CVI321	9D2
CVI019	PM2	CVI103	Y63	CVI183	W42	CVI322	SP2100
CVI020	220P	CVI104	PT15	CVI186	6F6	CVI323	VP2
CVI021	210LP	CVI105	ML6	CVI187	D4I	CVI324	SP4
CVI022	220PA	CVI106	9D2	CVI188	N43	CVI325	42MPT
CVI023	230XP	CVI107	15D2	CVI189	AC6Pen	CVI326	AC4Pen
CVI027	210LF	CVI108	8D2	CVI190	ACP4	CVI327	Pen1340
CVI028	220VSG	CVI109	4DI	CVI191	KTZ4I	CVI328	7D8
CVI032	220B	CVI111	VI907	CVI192	Z62	CVI329	PenA4
CVI035	QP2I	CVI113	UI7	CVI193	X65	CVI330	TSP4
CVI036	220PA	CVI116	V872	CVI194	20AI	CVI331	VP23
CVI037	MH4	CVI117	4IMTL	CVI195	KTW63	CVI332	VP2I
CVI038	MHL4	CVI118	KT2	CVI196	AC5PenDD	CVI333	22IPT
CVI039	I56I	CVI119	DDL4	CVI198	ACP4	CVI334	KT24
CVI040	PX25	CVI120	SU2150A	CVI208	PM256	CVI335	SP4I
CVI041	PM12M	CVI122	4IMXP	CVI220	4033A	CVI336	SP42
CVI042	210LF	CVI123	EF8	CVI237	PM24D	CVI337	116/Pen
CVI043	210PG	CVI124	MS/Pen	CVI238	PM24D	CVI338	220VPT
CVI044	210DDT	CVI125	MS/PenB	CVI246	PM202	CVI340	KT44
CVI045	X56	CVI126	4SH	CVI262	GUI	CVI341	MSP4
CVI046	PT25H	CVI127	Pen46	CVI263	RGI—125	CVI342	QP25
CVI049	210SPT	CVI129	MS/Pen	CVI264	UI8	CVI343	KTZ73
CVI050	HL2	CVI130	HL23	CVI265	UI5	CVI344	TP22
CVI051	Pen220A	CVI133	V960	CVI266	UI5	CVI345	TP25
CVI052	EL32	CVI134	HVR2	CVI267	U4020	CVI347	ECH35
CVI053	EF39	CVI135	EI148	CVI268	5Y3	CVI356	U22
CVI054	EB34	CVI136	EF54	CVI280	6L7	CVI359	ME4I
CVI055	EBC33	CVI137	EC52	CVI281	KTW61	CVI366	V248A
CVI056	EF36	CVI151	PM3	CVI282	MSP4	CVI367	V245
CVI057	EK32	CVI152	PM4DX	CVI283	SP4	CVI368	V266
CVI059	955	CVI153	PM254	CVI284	MS/Pen	CVI369	4061A
CVI060	807	CVI154	PM4DX	CVI285	6N7	CVI370	PVI-35
CVI061	DET19	CVI156	DEQ	CVI286	6L6	CVI401	CL33
CVI064	UI2/14	CVI158	PM14	CVI288	244V	CVI402	CY3I
CVI065	SP6I	CVI159	PM14	CVI289	156I	CVI403	DD4I
CVI066	P6I	CVI160	104V	CVI290	SU2150A	CVI404	EF36
CVI067	6J5	CVI161	104V	CVI291	HVR2	CVI406	HL4I
CVI071	U52	CVI163	PD220A	CVI296	MUI4	CVI407	Pen45
CVI072	GU50	CVI164	ACSG	CVI300	10DI	CVI408	P4I
CVI073	H63	CVI165	VMS4	CVI301	6H6	CVI409	SP2
CVI074	6J7	CVI166	P220	CVI302	D42	CVI410	TH2
CVI075	KT66	CVI167	PM24A	CVI303	PM1HF	CVI411	TH4I
CVI077	EM3I	CVI168	PX4	CVI304	LP2	CVI412	TV4
CVI078	DI	CVI169	VMP4G	CVI305	4DI	CVI413	UU6
CVI079	KT8	CVI170	D4I	CVI306	HL23DD	CVI414	VP4I
CVI080	4307A	CVI171	AT4	CVI307	PM1LF	CVI415	4011A
CVI081	4052A	CVI172	VMP4G	CVI308	TDD2A	CVI418	10DI
CVI082	220TH	CVI173	354V	CVI309	4019B	CVI419	11D3
CVI083	210VPT	CVI174	KT42	CVI310	KCI	CVI423	9D2
CVI088	832	CVI175	AP4	CVI311	B406	CVI424	20AI
CVI091	EF50	CVI176	AP4	CVI312	220RC	CVI425	7D5
CVI092	EA50	CVI177	4DI	CVI313	220LF	CVI426	EK2

Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
CVI427	EF9	CVI727	Z22	CVI851	5X4	CVI951	6L7
CVI428	EBC3	CVI732	ML4	CVI852	5X4X	CVI953	6N6
CVI429	EL2	CVI751	34	CVI853	6P25	CVI954	6N6
CVI430	ACSP3	CVI752	35	CVI854	5Y3	CVI956	6N7
CVI433	EC3I	CVI753	35A5	CVI855	UU9	CVI957	6N7
CVI434	EM4	CVI755	1626	CVI856	5Y3	CVI958	6N7
CVI436	HL2	CVI756	1629	CVI857	5Y4	CVI960	6R6
CVI437	EI143	CVI757	900I	CVI861	5Z3	CVI962	6R7
CVI438	KT6I	CVI758	1L4	CVI862	6AQ5	CVI963	6R7
CVI443	RI	CVI759	2C26A	CVI863	5Z4	CVI964	6R7
CVI444	42SPT	CVI762	6AK6	CVI864	5Z4	CVI966	6SA7
CVI445	40I2A	CVI763	6J4	CVI865	EC8I	CVI967	6SA7
CVI447	4030C	CVI769	2A6	CVI867	6A6	CVI969	6SC7
CVI448	4043C	CVI770	7A4	CVI870	6A7	CVI970	6SC7
CVI454	225DU	CVI771	39	CVI873	6AB7	CVI972	6SF5
CVI456	Pen383	CVI772	47	CVI876	1852	CVI973	6SF5
CVI457	VPI33	CVI773	82	CVI878	6AD7	CVI974	6S7
CVI458	4IMP	CVI774	1I2A	CVI882	6AG7	CVI975	6S7
CVI459	MU2	CVI775	36	CVI885	6B5	CVI978	6SG7
CVI460	X4I	CVI776	6D7	CVI887	6B6	CVI981	6SK7
CVI461	U22	CVI777	7C7	CVI891	6B7	CVI982	6SK7
CVI463	CBL3I	CVI784	6AK7	CVI893	6B8	CVI985	6SL7
CVI464	EF39	CVI790	7Z4	CVI894	6B8	CVI988	6SN7
CVI468	SP4	CVI794	959	CVI896	6C8	CVI990	6SQ7
CVI469	Z22	CVI796	DW4	CVI900	6D6	CVI991	6SQ7
CVI501	EI192	CVI797	408IA	CVI902	6D8	CVI993	6SS7
CVI502	KT32	CVI800	1A7	CVI906	6E5	CVI995	6S7
CVI503	KT33C	CVI802	1A7	CVI908	6F5	CVI996	6ST7
CVI504	VI90I	CVI803	1C5	CVI909	6F5	CVI999	IV
CVI505	MH4I	CVI805	1C5	CVI910	6F5	CV2000	EF9I
CVI508	VI913	CVI806	1D5	CVI911	6F6	CV2001	EF9I
CVI569	R3	CVI811	1D8	CVI912	6F6	CV2002	7D9
CVI570	EK32	CVI812	1E7	CVI915	6F7	CV2003	7D9
CVI574	SP4I	CVI815	6Q5	CVI917	6F8	CV2004	6AL5
CVI576	KT38	CVI816	6Y3	CVI918	6F8	CV2005	6AL5
CVI577	EI143	CVI817	1G4	CVI926	6F6	CV2007	12AU7
CVI578	EF50	CVI818	1H5	CVI929	6H6	CV2011	12AU7
CVI579	954	CVI819	6P5	CVI930	6H6	CV2106	DL66
CVI622	4052A	CVI820	1H5	CVI931	6H6	CV2107	DF66
CVI640	4002D	CVI821	1N5	CVI932	6J5	CV2115	E2004
CVI642	DER	CVI823	1N5	CVI933	6J5	CV2129	5763
CVI653	KCI	CVI824	1Q5	CVI934	6J5	CV2179	E2134
CVI655	4019B	CVI825	KT45	CVI935	6J7	CV2500	35Z4
CVI657	4020B	CVI826	1Q5	CVI936	6J7	CV2501	40
CVI659	4022B	CVI829	1T5	CVI937	6J7	CV2502	4IFP
CVI663	4021B	CVI831	2A3	CVI938	6K6	CV2503	41MH
CVI664	B406	CVI834	2A5	CVI940	6K6	CV2504	41MHL
CVI671	4021A	CVI835	2B28	CVI941	6K7	CV2505	41MPG
CVI691	DDL4	CVI836	4B26	CVI942	6K7	CV2506	41MPT
CVI695	DH30	CVI837	2B7	CVI943	6K7	CV2508	41STH
CVI696	B2I	CVI838	QQZ04-15	CVI944	6K8	CV2509	4IFP
CVI697	X4I	CVI839	6FI3	CVI945	6K8	CV2511	420T
CVI701	XL0	CVI846	5T4	CVI946	6K8	CV2512	420TDD
CVI702	XP	CVI847	19H4	CVI947	6L6	CV2514	43
CVI715	EBC3	CVI849	5W4	CVI948	6L6	CV2529	45IU
CVI718	ACTP	CVI850	6LI9	CVI950	6L7	CV2530	45Z5

Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
CV2531	46	CV2743	4033AF	CV2982	H610	CV3638	PenA4
CV2532	49	CV2769	9006	CV2985	HD24	CV3641	PM1HL
CV2533	50	CV2800	A40	CV2991	HL2	CV3642	PM1LF
CV2534	50L6	CV2806	AC/2HL	CV2994	HL23	CV3643	PM2A
CV2535	53	CV2807	AC2HL	CV2995	HL23DD	CV3645	PM2DX
CV2536	53A	CV2808	AC2Pen	CV2996	HL4IDD	CV3647	PM22A
CV2537	55	CV2809	AC5Pen	CV2998	HL133	CV3648	PM24E
CV2538	59	CV2811	AC/HL	CV2999	HL133DD	CV3649	PM22
CV2541	71A	CV2812	AC/HL	CV3500	HL210	CV3656	PT425
CV2542	72	CV2813	AC/HLDD	CV3501	HL610	CV3658	PVI-35
CV2543	73	CV2815	ACP	CV3502	HL1320	CV3691	S23
CV2544	78	CV2819	AC/S	CV3503	HLDD1320	CV3692	S23
CV2545	79	CV2820	AC/SPI	CV3505	HY114B	CV3695	S215
CV2546	81	CV2822	AC/SG	CV3506	HY615	CV3696	S215A
CV2547	83V	CV2823	AC/SP3	CV3515	KB2	CV3698	S610
CV2548	84	CV2824	AC/SPen	CV3516	KK2	CV3702	SG215
CV2549	85	CV2829	293A	CV3519	KT30	CV3703	SP4B
CV2556	117L7	CV2830	AC/THI	CV3520	KT3I	CV3704	SPI3C
CV2557	117N7	CV2832	AC/VP2	CV3527	KTW73	CV3721	T4D
CV2558	117Z6	CV2833	AF3	CV3529	KTZ4I	CV3723	T4I
CV2562	164V	CV2836	APP4G	CV3530	KTZ73	CV3726	TDD2A
CV2569	210DET	CV2837	APP4G	CV3531	L2	CV3727	TDD4
CV2570	210HF	CV2860	AZI	CV3532	L2I	CV3735	TP26
CV2571	210HL	CV2861	AZ2	CV3533	L22DD	CV3743	U5
CV2574	210VPA	CV2862	AZ3I	CV3534	L30	CV3744	U6
CV2581	220OT	CV2864	B2I	CV3538	L610	CV3747	U15
CV2582	220VS	CV2865	B30	CV3546	MHD4	CV3750	U22
CV2585	39	CV2874	1005	CV3552	MPT4	CV3751	U2I
CV2586	240B	CV2875	CL4	CV3553	MS4B	CV3752	U30
CV2594	258B	CV2887	DACI	CV3554	MPT42	CV3753	U3I
CV2600	267B	CV2889	DD620	CV3561	MS/Pen	CV3756	U600
CV2603	274A	CV2890	DDT	CV3562	MSP4I	CV3758	UR3C
CV2616	314A	CV2891	DE5	CV3565	ME4I	CV3759	R2
CV2630	351A	CV2892	DE5B	CV3567	MUI	CV3761	UU7
CV2640	405BU	CV2907	DFI	CV3570	MU4250	CV3787	VP2
CV2643	2C40	CV2909	DH73	CV3571	MVSPen	CV3788	VP4
CV2644	460BU	CV2910	DKI	CV3572	MVSPenB	CV3790	VPI3C
CV2645	RI	CV2911	DL2	CV3573	MZ05-20	CV3792	VP23
CV2679	866Jr	CV2912	DL63	CV3576	MX40	CV3793	VP24
CV2690	904V	CV2920	E1148	CV3578	PM22D	CV3794	VP210
CV2700	957	CV2925	EBF2	CV3582	VP4B	CV3795	VP215
CV2701	958A	CV2926	EBL3I	CV3587	705A	CV3796	VPI322
CV2704	7E5	CV2929	ECH3	CV3593	713A	CV3800	VS2
CV2705	1203	CV2930	ECH33	CV3594	717A	CV3802	VS24
CV2706	7C4	CV2938	EL33	CV3601	7193	CV3803	VS24
CV2707	123I	CV2940	EL36	CV3620	P220	CV3804	W2I
CV2709	1R4	CV2941	EL50	CV3621	P410	CV3805	W30
CV2710	3D6	CV2954	FC2A	CV3622	P610	CV3806	W3I
CV2712	1609	CV2955	FC4	CV3623	PA40	CV3810	WD30
CV2713	1610	CV2956	FC13C	CV3626	PenB4	CV3816	X2I
CV2714	1614	CV2959	3B2I	CV3630	Pen44	CV3817	X2I
CV2715	1630	CV2967	8020	CV3631	Pen45DD	CV3818	X22
CV2716	6SC7	CV2977	H2	CV3633	Pen23I	CV3819	X24
CV2717	1729	CV2978	H12	CV3634	Pen428	CV3820	X24
CV2718	1876	CV2979	H30	CV3635	Pen1340	CV3821	X3I
CV2735	4015A	CV2981	H410	CV3636	Pen1346	CV3822	X3I

Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.	Service No.	Civilian No.
CV3823	X4I	NR57	ML4	VR37	MH4	VT23A	230XP
CV3825	X63	NR58	244V	VR38	MHL4	VT45	X56
CV3826	X65	NR59	KT4I	VR40	PX25	VT46	PT25H
CV3831	XL2	NR60	H42	VR4I	PMI2M	VT50	HL2
CV3832	XP2	NR6I	W42	VR43	2I0PG	VT5I	Pen220A
CV3833	XSG2.OV	NR64	KTW62	VR44	2I0DDT	VT52	EL32
CV3834	XW2	NR65	MSP4	VR49	2I0SPT	VT60	807
CV3836	Z2I	NR66	D4I	VR53	EF39	VT60A	807
CV3837	Z2I	NR67	6L7	VR54	EB34	VT6I	DET19
CV3838	Z62	NR68	6Q7	VR55	EBC33	VT6IA	TVO3-10
CV3839	Z66	NR69	Y63	VR56	EF36	VT73	6F5
CV388I	EB4I	NR70	MS/Pen	VR57	EK32	VT74	6I7
CV3882	EBC4I	NR7I	MS/PenT	VR57A	EK32	VT75	KT66
CV3883	EAF42	NR72	N43	VR59	955	VT75A/B	KT44
CV3884	ECC40	NR73	6N7	VR65	SP6I	VT79	KT8
CV3885	EF40	NR74	PVI-35	VR65A	SP4I	VT80	4307A
CV3886	EF4I	NR75	ACP4	VR66	P6I	VT8I	4052A
CV3887	EF42	NR76	KTZ4I	VR67	6J5	VT88	832
CV3888	ECH42	NR77	6L6	VR78	DI	VTI04	PTI5
CV3889	EL4I	NR78	6C5	VR82	220TH	VTI05	ML6
CV3890	EL42	NR78A	L63	VR83	2I0VPT	VTI27	Pen46
CV389I	EZ40	NR79	Z62	VR9I	EF50	VT50I	EII92
CV3892	AZ4I	NR80	EII48	VR9IA	EF50	VT50IA	EII92
NR15	PM3	NR8I	6K7	VR92	EA50	VU39	MUI2/I4
NR15A	PM4DX	NR82	X65	VR95	954	VU64	UI2/I4
NR16	PM254	NR83	6J7	VR95A	954	VU7I	U52
NR16A	PM4DX	NR84	20AI	VR99	X66	VU7IA	U52
NR22	PMI4	NR85	6F6	VR99A	ECH35	VUII I	VI907
NR23	PMI4	NR86	KTW63	VR100	KTW62	VUII3	UI7
NR26	MHL4	NR87	ACSPenDD	VR10I	MHLD6	VUI20	SU2I50A
NR27	I04V	NR94	ACP4	VR102	BL63	VUI20A	SU2I50A
NR27A	I04V	NT20	PM256	VR106	9D2	VUI33	V960
NR28	PM2	NT37	4033A	VR107	I5D2	VUI34	HVR2
NR3I	MH4	NT62	PM24D	VR108	8D2	VU504	VI90I
NR35	PD220A	NT62A	PM24D	VR109	4DI	VU508	VI9I3
NR37	ACSG	NT82	PM202	VR109A	4DI	VW36	220PA
NR38	VMS4	NU3	UI2/I4	VR1I6	V872	VW42	2I0LF
NR39	PM22A	NUI2	UI8	VR1I7	4IMTL	VW48	2I5SG
NR40	PM24D	NUI3	UI5	VR1I7A	4IMTL		
NR4I	2I0VPT	NUI3A	UI5	VR1I8	KT2		
NR42	P220	NUI5	U4020	VR1I9	DDL4	American Army No.	Civilian No.
NR43	PM24A	NUI7	UU5	VR122	4IMXP	VTI	203A
NR44	PX4	NUI8	UI7	VR123	EF8	VT2	205B
NR45	VMP4G	NU20	U50	VR124	MS/Pen	VT4B/C	2I I
NR46	D4I	NU33	SU2I50A	VR125	MS/PenB	VT5	2I5A
NR47	PX25	NU33A	HVR2	VR126	4SH	VT6	2I2A
NR48	EBC33	VI 77	EM3I	VR129	MS/Pen	VT7	WXI2
NR49	EF36	VI I03	Y63	VR130	HL23	VT24	864
NR50	AT4	VR18	2I5SG	VR135	EI I48	VT25	10
NR5I	VMP4G	VR19	PM2	VR136	EF54	VT26	22
NR52	354V	VR2I	2I0LF	VR137	EC52	VT27	30
NR53	KT42	VR22	220PA	VR502	KT32	VT28	24
NR54	AP4	VR27	2I0LF	VR503	KT35	VT29	27
NR54A	AP4	VR28	220VSG	VR505	MH4I	VT30	0IA
NR55	4DI	VR32	220B	VT20	220P		
NR56	DA30	VR35	QP2I	VT23	230XP		

American Army No.	Civilian No.	American Army No.	Civilian No.	American Army No.	Civilian No.	American Army No.	Civilian No.
VT31	31	TV87	6L7	VT147	1A7	VT204	HK24G
VT33	33	VT88	6R7	VT148	1D8	VT205	6ST7
VT34	207	VT89	89	VT149	3A8	VT206A	5V4G
VT35	35/51	VT90	6H6	VT150	6SA7	VT207	12AH7
VT36	36	VT91	6J7	VT151	6A8	VT203	7B8
VT37	37	VT92	6Q7	VT152	6K6	VT209	12SG7
VT38	38	VT93	6B8	VT153	12C8	VT210	1S4
VT39	869	VT94	6J5	VT154	814	VT211	6SG7
VT39A	869A	VT95	2A3	VT161	12SA7	VT212	958
VT40	40	VT96	6N7	VT162	12S17	VT213A	6L5
VT41	851	VT97	5W4	VT163	6C8	VT214	12H6
VT42	872	VT98	6U5/6G5	VT164	1619	VT215	6E5
VT43	845	VT99	6F8	VT165	1624	VT216	816
VT44	32	VT100	807	VT167	6K8	VT217	811
VT45	45	VT101	837	VT168A	6Y6	VT221	305
VT46	866	VT103	6SQ7	VT169	12C8	VT222	884
VT46A	866A	VT104	12SQ7	VT170	1E5GP	VT223	1H5
VT47	47	VT105	6SC7	VT171	1R5	VT224	RK34
VT48	41	VT106	803	VT172	1S5	VT225	307A
VT49	39/44	VT107	6V6	VT173	1T4	VT229	6SL7
VT50	50	VT108	450TH	VT174	3S5	VT231	6SN7
VT51	841	VT109	2051	VT175	1613	VT232	E1148
VT54	34	VT112	6AC7	VT176	6AB7	VT233	6SR7
VT55	865	VT114	5T4	VT177	1LH4	VT239	1LE3
VT56	56	VT115	6L6	VT178	1LC5	VT241	7E5
VT57	57	VT117	6SK7	VT179	1LN5	VT243	7C4
VT58	58	VT118	832	VT180	3LF4	VT244	5U4
VT60	850	VT119	2X2	VT181	7Z4	VT247	6AG7
VT62	801	VT120	954	VT182	3B7	VT249	1006
VT63	42	VT121	955	VT183	1R4	VT250	EF50
VT64	800	VT122	530	VT184	VR90/30	VT264	3Q4
VT65	6C5	VT124	1A5	VT185	3D6	VT268	12SC7
VT65A	6C5G	VT125	1C5	VT187	575A	VT269	717A
VT66	6F6	VT126	6X5	VT188	7E6	VT287	815
VT66A	6F6G	VT131	12SK7	VT189	7F7	VT288	12SH7
VT68	6B7	VT132	12K8	VT190	7H7	VT289	12SL7
VT69	6D6	VT133	12SR7	VT191	316A		
VT70	6F7	VT134	12A6	VT192	7A4		
VT72	842	VT135	12J5	VT193	7C7		
VT73	843	VT136	1625	VT194	7J7		
VT74	5Z4	VT137	1626	VT195	1005		
VT75	75	VT138	1629	VT196	6W5		
VT76	76	VT139	VR150-30	VT197A	5Y3G		
VT77	77	VT140	1628	VT198A	6G6		
VT78	78	VT141	531	VT199	6SS7		
VT80	80	VT143	805	VT200	VR105-30		
VT83	83	VT144	813	VT201	25L6		
VT84	84/6Z4	VT145	5Z3	VT202	9002		
VT85	6K7	VT146	1N5GT	VT203	9003		

B.V.A. UTILITY EQUIVALENTS	
B.V.A. No.	Civilian No.
132	HL23DD
142	VP23
162	Pen25
172	TP25
211	DW4/350
243	EF39
264	EL33
274	ECH35



## AMENDMENTS No's. 1 & 2.

This manual already incorporates the above amendments and it is therefore only necessary for you to commence inserting amendments No. 3.

## INFORMATION SERVICE 5394

complete with all amendments and additional data ever constantly appearing upon the market, and in up-to-date as possible, "AVO" now offer you a FREE

The completion and return of the coupon at the bottom of this page will bring you periodical issues of data to the end of June 1952.

This supplementary information will take the form of adhesive backed sheets, from which lines of suitable fresh data can be cut and inserted in the correct alphabetical and numerical position upon the blank pages facing the main tabulated data within this publication. You will thus not only be able to keep your book fully up to date, but ease of reference will also be maintained.

Should you find an error in this publication, we will be very pleased if you will notify us in writing. Your co-operation will be of great assistance to us when any necessary amendments to the book are being compiled.

A coupon is attached to enable you to notify us should you change your address.

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"AVO" TECHNICAL INFORMATION SERVICE

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Name .....

The old Address was .....

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"AVO" TECHNICAL INFORMATION SERVICE

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Name .....

Address .....

Signature .....

PLEASE MAIL PERIODICAL ISSUES OF DATA

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TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P      642 310 000      S      4      I      200      200      24      2.5      100      PenLF      2.5      B5      AC/Pen

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
AABI	023 1 10 980		4						D			8SC	DDD
ABCI	023 198 060	G <sub>1</sub>	4	7	250		4	2	100		2	8SC	DDT
ABLI	023 198 560	G <sub>1</sub>	4	6	250	250	36	9	100	PenLF	9-0	8SC	DDP
ABI	802 310 000	D <sub>1</sub>	4						D			B5	DD
ACD	802 310 000		4						D			B5	D
ACDD	892 310 000		4						D			B5	DD
AC/DDT	809 231 600	G <sub>1</sub>	4	4	200		5	2-3	100		2-3	B7	DDT
AC/DX	642 310 000		4	3	200		5	3-5	100		3-5	B5	T
AC/G	642 310 000		4	7-5	200		8	2-7	100		2-7	B5	T
ACHF	642 310 000		4	3	200		3	2-5	100		2-5	B5	T
ACHL	642 310 000		4	1	100		10	3	100		3	B5	T
AC/HLDD	809 231 600	G <sub>1</sub>	4	3	200		4-9	2-6	100		2-6	B7	DDT
ACHLDDD	809 231 610	G <sub>1</sub>	4	3	200		4-9	2-6	100		2-7	B9	DDDT
ACHL4	642 310 000		4	5	250		5	3-3	100		3-3	B5	T
ACHL4DD	809 231 600	G <sub>1</sub>	4	3	250		7	2-5	100		2-5	B7	DDT
ACHM4	542 310 000	A	4		250	100	10	2-5	100	100	2-5	B5	P
AC/HP	041 231 500	A	4	2	200	100	4-2	3-2	100	100	3-2	B7	P
AC/HP	543 210 000	A	4	2	200	100	4-2	3-2	100	100	3-2	B5	P
ACHI	475 231 600	G <sub>1</sub>	4	2	150		5	2-0	100		2		
ACH4	642 310 000		4		75	75	2-5		80	75		B7	TH
			4	4	200		3	3-3	100		3-3	B5	T
AC/L	642 310 000		4	13-5	250		17	4-25	100		4-25	B5	T
AC/LP	642 310 000		4	14	200		18	4-25	100		4-25	B5	T
ACL4	642 310 000		4	15	250		9	4	100		4	B5	T
ACME4	642 310 000	S	4	16	250	250	26		100	PenLF		B5	T
ACP	642 300 000		4	21	200		19	3	100		3	B4	T
AC/P	642 310 000		4	13-5	200		17	2-75	100		2-75	B5	T
ACPN	642 350 000		4	12	250	200	22		100	PenLF		B5	P
ACPNDH	642 350 000		4	10	250	200	18		100	PenLF		B5	P
AC/PP	642 300 000		4	25	400		50	5	100		5	B4	T
AC/Pen	045 231 600		4	1	200	200	24	2-5	100	PenLF	2-5	B7	P
ACPT	642 310 000	S	4	8	250	200	31		100	PenLF		B5	P
ACPI	642 310 000		4	28	200		24	2-3	100		2-3	B5	T
ACPX4	642 310 000		4	18	250		30	4	100		4	B5	T
ACPX4a	642 300 000		4	25	250		50	5	100		5	B4	T
ACP4	042 310 000	A	4	1	100			7	100		7	B5	T
ACQ	045 231 600		4	22	375	250	57	6	100	PenLF	6	B7	P
ACQA	045 231 600		6	23	375	250		6	100	PenLF	6	B7	P
AC/SG	542 310 000	A	4	1-5	200	60	4-5	1-9	200	60	1-9	B5	P
AC/SGVM	542 310 000	A	4	2	200	60	5-8	1-8	200	60	2	B5	P
AC/SH	542 310 000	A	4	1-5	200	75	7-4	3-5	200	75	3-5	B5	P
AC/SL	041 230 500	A	4	1	200	75	3-8	3-3	200	75	3-3	B7	P
AC/SL	061 230 500	G <sub>1</sub>	4	1	200	75	3-8	3-3	200	75	3-3	B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
AC/S2	542 310 000	A	4	1.5	200	75	7	4.3	200	60	3.4	B5	P
ACSPI	041 231 500	A	4	3	200	200	4.9	2.7	100	PenLF	2.7	B7	P
ACSP3	061 231 500	G <sub>1</sub>	4	1.7	250	100	7.9	7	200	100	7.5	B7	P
AC/SIVM	542 310 000	A	4	1.5	200	75	5.6	1.1	200	75	1.1	B5	P
ACS2Pen	041 231 500	A	4	1.5	250	100	8	4.6	200	100	5.5	B7	P
ACTHI	645 231 700	G <sub>1</sub>	4	—	75		6.0	3.0	80		3		
				{ 3	250	100	3	3.5	100	100	3.5	B7	TH
ACTHIA	217 640 530	G <sub>1</sub>	4	{ 3	75		6.0	3.0	80		3	MO8	TH
				{ 3	250	100	3	3.5	100	100	3.5		
ACTP	571 231 640	G <sub>1</sub>	4	{ 3	150		1.5	1.4	100		1.4		
				{ 5	250	200	6.5		100	PenLF		B9	TP
ACVG	542 310 000	A	4	0	200	75	5	3	200	75	3	B5	P
ACVH	542 310 000	A	4	1.5	200	75	9.3	3.3	200	75	3.3	B5	P
AC/VP	041 231 500	A	4	1.5	200	100	5.7	3	200	100	3	B7	P
AC/VP	542 310 000	A	4	1.5	200	100	5.7	3	200	100	3	B5	P
ACVPB	061 231 500	G <sub>1</sub>	4	1.5	250	250	12	4	250	200	4	B7	P
AC/VPI	041 231 500	A	4	2.8	250	200	7.4	2	100	PenLF	2	B7	P
AC/VP2	061 231 500	G <sub>1</sub>	4	2.8	250	200	7.4	2	100	PenLF	2	B7	P
AC/VP4	041 231 500	A	4		250	100	6	3	100	100	3	B7	P
ACVS	542 310 000	A	4	1.5	200	75	4.4	3	200	75	3	B5	P
ACVS4	542 310 000	A	4	2	250	50	6	2	200	60	2	B5	P
AC/Y	045 231 600		4	10	250	250	32	3.5	100	PenLF	3.5	B7	P
AC/Y	642 310 000	S	4	10	250	250	32	3.5	100	PenLF	3.5	B5	P
AC/YY	045 231 600		4	10	250	250	68		100	PenLF		B7	P
AC/YC	045 231 600		4	10	250	250	68	7.5	100	PenLF	7.5	B7	P
AC/Z	642 310 000	S	4	5.5	250	250	32	8	100	PenLF	8	B5	P
AC/Z	045 231 600		4	5.5	250	250	32	8	100	PenLF	8	B7	P
AC/ZDD	869 231 500	G <sub>1</sub>	4	5.5	250	250	32	8	100	PenLF	8	B7	DDP
AC2	023 100 060	G <sub>1</sub>	4	5.5	250		6	2.5	100		2.5	8SC	T
AC2DD	869 231 500	G <sub>1</sub>	4	5.5	250	250	32		100	PenLF		B7	DDP
AC2/HL	642 310 000		4	1.75	200		4.9	5	100		5	B5	T
AC2/Pen	045 231 600		4	5.3	250	250	32	8.5	100	PenLF	8	B7	P
AC2/PenDD	869 231 500	G <sub>1</sub>	4	5.3	250	250	32	8.5	100	PenLF	8	B7	DDP
AC3Pen	045 231 600		4	3	250	250	36	9	100	PenLF	9	B7	P
AC4/Pen	045 231 600		4	8.5	225	225	52	11	100	PenLF	10	B7	P
AC5/Pen	045 231 600		4	8.5	250	250	40	9.4	100	PenLF	9.4	B7	P
AC5/PenDD	869 231 500	G <sub>1</sub>	4	8.5	250	250	40	9.4	100	PenLF	9.4	B7	DDP
AC6/Pen	045 231 000	A	4	6.9	300	225	63	9.5	100	100	8.5	B7	P
AC/042	642 300 000		2	38	300		50	5	100		5	B4	T
AC/044	642 300 000		4	48	300		50	5	100		5	B4	T
AC/064	642 300 000		4	21	200		20	3	100		3	B4	T
AC084	642 300 000		4	22	300		17	1.1	100		1.1	B4	T
AC084N	642 300 000		4	0	100			2.5	100		2.5	B4	T
AC104	642 310 000		4	10	150		8.5	3.5	100		3.5	B5	T
AD	281 300 000		6				60		REC		20mA	B4	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	023 104 560		4	6.5	250	250	36	9.5	100	150	8	8SC	AL3
P	023 104 560		4	6.5	250	250	36	9.5	100	150	8	8SC	AL4
P	023 104 560		4	8	350	250	24		100	150		8SC	AL4/375
P	023 104 560		4	15	250	250	72	7	100	150	6	8SC	AL5



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
ADI	023 004 060		4	45	250		60	6	100		6	8SC	T
ADI/350	023 004 060		4	66	350		84		100			8SC	T
ADG	642 310 000		20	10	200		10	3.5	100		3.5	B5	T
ADHF	642 310 000		20	3	200		5	3.5	100		3.5	B5	T
ADHP	041 231 500	A	20		200	100	5	2.8	200	100	2.8	B7	P
ADL	642 310 000		20	13	200		20	3	100		3	B5	T
ADPN	642 350 000		20	15	250	200	22		100	PenLF		B5	P
ADVHP	041 231 500	A	20		200	100	5.5	2.5	200	100	2.5	B7	P
AE	265 413 000		13	13.5	100	100	8.5	1.65	100	90	1.65	UX6	P
AF	281 300 000		2.5				120		REC		30mA	UX4	R
AF2	542 310 000	A	4	2	225	100	4.25	2.5	200	100	3.2	B5	P
AF3	023 110 560	G <sub>1</sub>	4	3	250	100	8	1.8	250	100	1.8	8SC	P
AF7	023 110 560	G <sub>1</sub>	4	2	250	100	3	2.1	250	100	2.1	8SC	P
AG	289 300 000		5				120		REC		30mA	UX4	RR
AG495	642 310 000		4	4	200		4	2.5	100		2.5	B5	T
AG4100	642 300 000		4	3	150		5	2	125		2	B4	T
AH1	023 145 560	G <sub>1</sub>	4	2	250	75	3	1.8	200	75	1.8	8SC	P
AH100	023 145 560	G <sub>1</sub>	4	2.5	200	100	5.5	1.5	100	100	1.5	8SC	P
AH4105	542 310 000	A	4		250		1.6		100			B5	T
AK2	123 164 570	G <sub>1</sub>	4	1.5 8.5	90 250	75	2 1.6		90 100			8SC	O
AL1	023 004 560		4	15	250	250	36	2.8	100	PenLF	2.8	8SC	P
AL2	023 100 560	G <sub>1</sub>	4	25	250	250	36	2.6	100	PenLF	2.6	8SC	P
AL3	245 231 600		4	3	250	250	36	9	100	PenLF	9	B7	P
AL4	145 231 600		4	3	250	250	36	9	100	PenLF	9.5	B7	P
AL4/375	145 231 600		4	8	350	250	24		100	PenLF		B7	P
AL5	145 231 600		4	14	300	275	72	8.5	100	PenLF	7	B7	P
AL5/375	023 104 560		4	19.5	350	275	48		100	PenLF		8SC	P
AL60	041 231 500	A	4	7	250	250	72	14.5	100	PenLF	8.5	B7	P
AL495	642 310 000		4	12	250		20	4	100		4	B5	T
APP4A	045 231 600		4	16.5	250	250	36	3.5	100	PenLF	3.5	B7	P
APP4As	023 100 560	G <sub>1</sub>	4	16.5	250	250	36	3.5	100	PenLF	3.5	8SC	P
APP4B	045 231 600		4	5	250	250	32	10	100	PenLF	10	B7	P
APP4Bs	023 104 560		4	5	250	250	32	10	100	PenLF	10	8SC	P
APP4C	145 231 600		4	5	250	250	36	10	100	PenLF	10	B7	P
APP4D	145 231 600		4	16	250	250	72	7	100	PenLF	7	B7	P
APP4E	145 231 600		4	13.5	350	275	72	8.5	100	PenLF	8.5	B7	P
APP4E	023 104 560		4	13.5	350	275	72	8.5	100	PenLF	8.5	8SC	P
APP4G	041 231 500	A	4	6	250	250	36	10	100	PenLF	10	B7	P
APP4G	005 231 600	G <sub>1</sub>	4	6	250	250	36	10	100	PenLF	10	B7	P
APP495	642 350 000		4	23	300	200	25	2	100	100	2	B5	P
APV4	892 300 000		4				60		REC		20mA	B4	RR
APP4120	642 310 000		4	15	350	200	22	3.5	100	100	3.5	B5	P
APV4200	892 300 000		4				60		REC		20mA	B4	RR
AR495	642 310 000		4	1	100			5	100		5	B5	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
AR4100	642 310 000		4	3	200		3	2	150		2	B5	T
AR4101	642 310 000		4	1	100			3	100		3	B5	T
AS494	542 310 000	A	4		200	100	15	1.5	100	100	1.5	B5	P
AS4100	542 310 000	A	4	6	200	100	4	1.425	100	90	1.4	B5	P
AS4120	542 310 000	A	4	2	250	100	3	3	150	100	3	B5	P
AS4125	542 310 000	A	4	2	250	100	3	3	200	100	3	B5	P
AX	264 300 000		5	9	150		3	0.8	100		0.8	UX4	T
AX1	892 300 000		4				60		REC		20mA	B4	R
AX50	892 300 000		4				120		REC		30mA	B4	RR
AZ1	023 080 090		4				30		REC		15mA	8SC	RR
AZ2	023 080 090		4				60		REC		20mA	8SC	RR
AZ3	023 180 090		4				60		REC		20mA	8SC	RR
AZ4	023 080 090		4				120		REC		30mA	8SC	RR
AZ31	020 809 030		4				30		REC		15mA	AO8	RR
AZ32	020 809 030		4				60		REC		20mA	AO8	RR
AZ41	*8***9 230		4				30		REC		10mA	B8A	RR
AZ50	023 080 090		4				120		REC		30mA	8SC	RR
AI1A	892 300 000		4				60		REC		20mA	B4	RR
AI1B	892 300 000		4				60		REC		20mA	B4	RR
AI1C	892 300 000		4				60		REC		20mA	B4	RR
AI1D	892 300 000		4				60		REC		20mA	B4	RR
A23A	809 231 600	G <sub>1</sub>	4	1	100			2.9	100		2.9	B7	DDT
A26	264 300 000		15	1.5	90		4.5	1.16	80		1.16	UX4	T
A27D	819 236 500	G <sub>1</sub>	4	6	250	250	36	9.5	100	PenLF	9.5	B7	DDT
A28	264 300 000		15	1.5	90		7.5	1.16	90		1.16	UX4	T
A30	264 300 000		15	27	175		22	1.08	100		1.08	UX4	T
A30B	642 310 000		4	2	250		10	5.5	200		5.5	B5	T
A30D	642 310 000		4	3.5	200		6	2.4	100		2.4	B5	T
A32	264 300 000		15	3	150		1.5	0.94	150		0.94	UX4	T
A36B	645 231 700	G <sub>1</sub>	4	2	100		22	6	100		6	B7	TH
				2	250	150	3.5		100	PenLF			
A40	264 300 000		15	40.5	175		21	1.5	100		1.5	UX4	T
A40M	254 130 000	A	4	1.5	200	100	3	2	200	100	3	UX5	P
A40M	542 310 000	A	4	1.5	200	100	3	2	200	100	3	B5	P
A48	264 300 000		15	4.5	90		4.5	1.18	80		1.18	UX4	T
A50A	542 310 000	A	4	2	200	100	3	2.3	100	100	2.3	B5	P
A50A	040 231 500	A	4	2	200	100	3	2.3	100	100	2.3	B7	P
A50B	061 231 500	G <sub>1</sub>	4	1.5	250	250	6	3.5	200	200	3.5	B7	P
A50M	041 231 500	A	4	2	200	125	4.5	2.3	100	100	2.3	B7	P
A50M	542 310 000	A	4	2	200	125	4.5	2.3	100	100	2.3	B5	P
A50N	542 310 000	A	4	2	225	100	4.25	2.5	200	100	2.5	B5	P
A50N	041 231 500	A	4	2	225	100	4.25	2.5	200	100	2.5	B7	P
A50P	060 231 500	G <sub>1</sub>	4	3	250	250	11.5	2	100	PenLF	2	B7	P
A70B	642 310 000	S	4	25	250	250	36	2.6	100	PenLF	2.6	B5	P
A70B	045 231 600		4	25	250	250	36	2.6	100	PenLF	2.6	B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

O	645 231 700	G <sub>1</sub>	4	$\left\{ \begin{array}{l} 1.8 \\ 1.5 \end{array} \right.$	$\left\{ \begin{array}{l} 90 \\ 250 \end{array} \right.$	$\left\{ \begin{array}{l} 75 \\ 75 \end{array} \right.$	$\left\{ \begin{array}{l} 2 \\ 1.5 \end{array} \right.$		$\left\{ \begin{array}{l} 80 \\ 100 \end{array} \right.$	$\left\{ \begin{array}{l} 60 \\ 75 \end{array} \right.$		$\left. \vphantom{\left\{ \begin{array}{l} 80 \\ 100 \end{array} \right.}} \right\} B7$	A80A
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
A70C	045 231 600		4	3	250	250	36	9	100	PenLF	9	B7	P
A70D	045 231 600		4	3	250	250	36	9	100	PenLF	9	B7	P
A70E	045 231 600		4	14	250	275	72	8.5	100	PenLF	8.5	B7	P
A70P	045 231 600		4	14.5	250	250	70		100	PenLF		B7	P
A80A	123 174 560	G <sub>1</sub>	4	1.8 8.5	90 250		2 16		80 100			8SC	O
A104	642 300 000		1.1	10	100		5	0.35	100		0.35	B4	T
A203	642 300 000		2	30	150		12	1.5	100		1.5	B4	T
A205	642 300 000		2	18	150		7	1.2	100		1.2	B4	T
A206	642 300 000		2	8.5	150		3.8		100		1	B4	T
A209	642 300 000		2	9	150		4	1.0	100		1.0	B4	T
A210	642 300 000		2	9	125		3	0.9	100		0.9	B4	T
A211	642 300 000		2	2	150		2	1.2	100		1.2	B4	T
A225	642 300 000		2	3	150		1	1.0	100		1.0	B4	T
A241	642 300 000	S	2	2	20	20	1.2	1.0	No Data Available			B4	P
A242	265 300 000	G <sub>1</sub>	2	3	125	75	1.7	0.6	100	75	0.6	UX4	P
A404	642 300 000		4	10	100		4	0.45	100		0.45	B4	T
A406	642 300 000		4	9	150		6	0.45	100		0.45	B4	T
A408	642 300 000		4	4	150		4	1.5	100		1.5	B4	T
A409	642 300 000		4	9	150		3.5	0.9	100		1.2	B4	T
A410	642 300 000		4	3	150		3.5	0.5	100		1.2	B4	T
A410	264 300 000		4	3	150		3.5	0.5	100		1.2	UX4	T
A410N	642 200 000		4	3	150		3.5	0.5	100		0.5	B4	T
A411	642 300 000		4	3	200		6	2.5	150		2.5	B4	T
A414K	642 300 000		4	3	150		3.5	0.5	100		2	B4	T
A415	642 300 000		4	9	150		3.5	0.9	100		2	B4	T
A416	642 300 000		4	4.5	150		4	2	100		2	B4	T
A420	642 300 000		4	4	150		4	1.5	100		1.5	B4	T
A425	642 300 000		4	2.5	200		0.25	1.2	100		1.2	B4	T
A430	642 300 000		4	3	200		6	2.5	150		2.5	B4	T
A430	042 300 000	A	4	0	150		1.5	0.5	150		0.5	B4	T
A435	642 300 000		4	1	150		2.1	0.5	150		0.5	B4	T
A440N	642 310 000		4	1.6	200		0.2	2.2	150		2.2	B5	T
A442	542 300 000	A	4	1	200	100	4	0.7	200	100	0.8	B4	P
A442	254 300 000	A	4	1	200	100	4	0.7	200	100	0.8	UX4	P
A557	602 310 000	G <sub>1</sub>	4	8	150		28	2	100		2	B5	T
A600	642 300 000		6	9	150		4	1.5	100		1.5	UX4	T
A609	642 300 000		6	9	150		4	1.5	100		1.5	B4	T
A615	642 300 000		6	4.5	150		4	2.4	100		2.4	B4	T
A630	642 300 000		6	1.5	150		0.7	1.5	150		1.5	B4	T
A635	642 300 000		6	1	150		1.2	1.5	150		1.5	B4	T
A642	542 300 000	A	6	1	200	100		0.7	200	100	0.7	B4	P
A802	642 310 000		4	3	100		2.5	2.5	100		2.5	B5	T
A863	026 500 310	G <sub>1</sub>	6	3	250	100	2	1.23	100	100	1.2	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

TT	027 146 310	G <sub>1</sub>	6	16	250		14	4.2	100		4.2	A08	BL63
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T	264 300 000		4	15	150		8	1.3	100		1.3	UX4	B406
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
AI685M	026 510 310	G <sub>1</sub>	6	3	125	100	8	3.2	100	100	3.2	A08	P
AI820	265 004 130		6		250	250	40	10.5	100	PenLF	9	B8B	P
A4090	642 310 000		4	3.5	250		6	2.4	150		2.4	B5	T
BA2	446 230 700		2	0	150		1.5		150			B7	TT
BB1	902 310 000	D <sub>1</sub>	16						D			B5	DD
BBC12	682 390 000	G <sub>1</sub>	2	4.5	150		2.5	1.5	100		1.5	B5	DD1
BB220A	446 230 700		2	3	150		4		100			B7	TT
BB240	446 230 700		2	0	150		5.4		100			B7	TT
BF1	642 300 000		4	15	150		8	1.3	100		1.3	B4	T
BL2	652 310 000	G <sub>1</sub>	30	20	200	100	40	3	100	90	3	B5	P
BL62	027 146 310	G <sub>1</sub>	6	16	250		14	4.2	100		4.2	A08	TT
BW3	642 350 000		2	4.5	150	125	6	2.2	100	100	2.2	B5	P
BW602	642 300 000		2	12	150		12	3.4	100		3.4	B4	T
BW1304	642 300 000		2	6	150		6	3.2	100		3.2	B4	T
BX2	446 230 700		2	0	175		2.5		100			B7	TT
BX604	642 300 000		2	12	150		8	1.5	100		1.5	B4	T
B2	642 300 000		2	2	125		2	1.2	100		1.2	B4	T
B7	642 300 000		6		125		8	0.67	100		0.67	B4	T
B11	642 300 000		6		200		20	1.4	100		1.4	B4	T
B21	447 230 600		2	6	150		2.2		100			B7	TT
B22	446 230 700		2		150		5		150			B7	TT
B23	642 300 000		2		125		4	0.75	100		0.75	B4	T
B24	446 230 700		2	0	150		7		100			B7	TT
B30	447 231 600		13	0	175				100			B7	TT
B36	471 461 230		13	8	250			2.6	100		2.6	A08	TT
B63	264 147 300		2	5	250		6	3.1	200		3.1	UX7	TT
B65	471 461 230		6	9	250		9	2.6	100		2.6	A08	TT
B203	642 300 000		2	26	150		11	1.5	100		1.5	B4	T
B204	264 300 000		2	22.5	125		8	0.9	100		0.9	UX4	T
B205	642 300 000		2	18	150		7	1.2	100		1.2	B4	T
B217	642 300 000		2	4.5	150		3	1.3	100		1.3	B4	T
B228	642 300 000		2	2	150		2	1.2	100		1.2	B4	T
B230	446 230 700		2	1	150		5.5		150			B7	TT
B240	470 642 300		2	0	150		15		150			C7	TT
B242	542 300 000	A	2	0	200	75	4.5	1.1	100	75	1.1	B4	P
B242	254 300 000	A	2	0	200	75	4.5	1.1	100	75	1.1	UX4	P
B255	542 300 000	A	2	1	150	100	1.8	1.2	150	100	1.2	B4	P
B255	254 300 000	A	2	1	150	100	1.8	1.2	150	100	1.2	UX4	P
B262	542 300 000	A	2	1	150	100	1.8	1.3	150	100	1.3	B4	P
B342	265 300 000	G <sub>1</sub>	2	2.5	150	75	4	1.3	150	75	1.3	UX4	P
B403	642 300 000		4	30	150		15	1.5	100		1.5	B4	T
B405	642 300 000		4	18	150		11	1.6	100		1.6	B4	T
B406	642 300 000		4	15	150		8	1.4	100		1.4	B4	T
B409	642 300 000		4	16	250		12	2	100		2	B4	T
B415	642 300 000		4	4.5	150		3	2	100		2	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
B424	642 300 000		4	2.3	200		6	2.5	150		2.5	B4	T
B424S	642 300 000		4	3	200		6	2.5	100		2.5	B4	T
B425	642 300 000		4	4.5	150		3	2	100		2	B4	T
B438	264 300 000		4	2.5	200		0.2	2	150		2	UX4	T
B438	642 300 000		4	2.5	200		0.2	2	150		2	B4	T
B438S	642 300 000		4	1.5	200		2	2	150		2	B4	T
B442	542 300 000	A	4	1	200	100	4.5	0.9	200	100	0.9	B4	P
B442M	542 300 000	A	4	1	200	100	4.5	0.9	100	100	0.9	B4	P
B442M	254 300 000	A	4	1	200	100	4.5	0.9	100	100	0.9	UX4	P
B442S	542 300 000	A	4	1	200	100	4.5	0.9	100	100	0.9	B4	P
B443	642 350 000		4	17	200	150	12	1.2	100	PenLF	1.2	B5	P
B443S	642 350 000		4	12	250	75	12	1.6	100	60	1.6	B5	P
B491	642 310 000		4	1.5	200		4	4	150		4	B5	T
B543	642 350 000		5	15	200	150	12	1.3	150	100	1.3	B5	P
B543(S)	642 350 000		5	15	200	150	12	1.3	150	100	1.3	B5	P
B605	642 300 000		6	18	150		9	1.8	100		1.8	B4	T
B609	642 300 000		6	18	250		12	1.8	100		1.8	B4	T
B2006	642 310 000		20	18	200		15	1.6	100		1.6	B5	T
B2038	642 310 000		20	3	200		6	2.3	100		2.3	B5	T
B2041	602 300 000	G <sub>1</sub>	20	1	100		2.5	0.1	100		0.1	B4	T
B2042	542 310 000	A	20	2	200	60	4	1	100	60	1	B5	P
B2043	642 310 000	S	20	18	200	200	20	1.7	100	100	1.7	B5	P
B2044S	642 310 000	D <sub>1</sub>	20	3	200		6	1.8	100		1.8	B5	DT
B2045	542 310 000	A	20	2	200	60	4	1	150	60	1	B5	P
B2046	542 310 000	A	20	2	200	100	3	2.2	150	100	2.2	B5	P
B2047	542 310 000	A	20	2	200	100	4	2	150	100	2	B5	P
B2055	542 310 000	A	20	1.5	200	100	3	2	100	100	2	B5	P
B2052T	542 310 000	A	20	2	200	100	3	2	150	100	2	B5	P
B2099	642 310 000		20	1.6	200		0.08	3	150		3	B5	T
CBCI	023 198 060	G <sub>1</sub>	13	7	250		4	2	100		2	8SC	DDT
CBLI	023 189 560	G <sub>1</sub>	44	8.5	200	200	45	8	100	PenLF	7	8SC	DDP
CBL6	023 198 560	G <sub>1</sub>	44	8	100	100	45	6	100	75	6	8SC	DDP
CBL31	026 985 310	G <sub>1</sub>	44	8.5	200	200	45	8	100	PenLF	7	A08	DDP
CB215	446 230 700		2	1	150		15	1.7	100		1.7	B7	TT
CB215S	023 064 470		2	1	150		12	1.7	100		1.7	8SC	TT
CB220	446 230 700		2	3	150		15		100			B7	TT
CCHI	023 164 570	G <sub>1</sub>	20	10	200		2.5	2.3	100		2.3		
				2	200	50	2		100	60		8SC	TH
				1	100		10	2.4	100		2.8		
CCH35	027 546 310	G <sub>1</sub>	7.5	2	250	100	3		200	100	4	A08	TH
CCI	023 200 060	G <sub>1</sub>	13	3.7	200		2.6	2	150		2	8SC	T
CC2	023 100 060	G <sub>1</sub>	13	5.5	250		6	2.5	200		2.5	8SC	T
CE230	320 200 000	D <sub>1</sub>	2.5				30		REC		15mA	UX4	R
CFI	023 110 560	G <sub>1</sub>	13	2	200	100	3	2.3	100	100	2.3	8SC	P
CF2	023 110 560	G <sub>1</sub>	13	2	200	100	4.5	2.2	100	100	2.2	8SC	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

R	812 380 000		6				60		Rec	23mA	B7G	CV135
DT	812 314 600		6	3	200		7.5	2.5	100	2.5	B7G	CV137
T	412 314 600		6	1.5	250		10	9	100	6	B7G	CV139

R	802 310 000		20				60		Rec	23mA	B5	C10B
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P	045 231 600		35	8.5	200	200	45	8	100	PenLF	7	B7	C70D
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
CF3	023 110 560	G <sub>1</sub>	13	2	100	80	7.5	2.1	100	75	2.1	8SC	P
CF7	023 110 560	G <sub>1</sub>	13	2	100	100	3	2.1	100	100	2.1	8SC	P
CF50	123 100 560	G <sub>1</sub>	30	2	100	100	1.5	3.3	100	100	3.3	8SC	P
CHI	023 145 560	G <sub>1</sub>	13	2	250	75	3	1.8	200	75	1.8	8SC	P
CKI	023 154 560	G <sub>1</sub>	13	1.5	200	90	1.6		200	75	1.6	8SC	P
CK1007	008 092 030		1				60		REC		20mA	A08	RR
CLI	023 100 560	G <sub>1</sub>	13	14	200	200	25	2.5	100	PenLF	2.5	8SC	P
CL2	023 100 560	G <sub>1</sub>	24	15	100	100	50	3.8	200	75	3.8	8SC	P
CL4	023 100 560	G <sub>1</sub>	33	8.5	200	200	45	8	100	PenLF	7	8SC	P
CL6	023 100 560	G <sub>1</sub>	35	9.5	200	100	45	8	100	90	7	8SC	P
CL33	026 540 310		33	8.5	200	200	45	8	100	100	7	A08	P
CY1	023 100 080		20				75		REC		23mA	8SC	R
CY2	123 190 080		30				60		REC		20mA	8SC	RR
CY31	020 080 310		20				120		REC		30mA	A08	R
CY32	029 180 310		30				60		REC		23mA	A08	RR
C9	642 300 000		4	9	150		3.5	0.9	100		0.9	B4	T
C10B	023 100 080		20				75		REC			8SC	R
C20C	982 310 000		13						D			B5	D
C23B	809 231 600	G <sub>1</sub>	13	5	200		4	2	100		2	B7	DDT
C25	642 300 000		4	2.5	200		2.3	1.2	150		1.2	B4	T
C30B	000 231 600	G <sub>1</sub>	13	4	200		4	3.2	150		3.2	B7	T
C50B	061 231 500	G <sub>1</sub>	13	2.2	200	200	2.5	2.8	100	PenLF	2.8	B7	P
C50N	061 231 500	G <sub>1</sub>	13	2	200	200	9.5	2	100	150	2	B7	P
C70D	023 110 560	G <sub>1</sub>	33	8.5	200	200	45	8	100	PenLF	7	8SC	P
C80B	123 154 560	G <sub>1</sub>	13	1.5	200	90	1.6		150	75		8SC	P
C109	642 300 000		1	9	150		3.5	0.5	100		0.5	B4	T
C125	642 300 000		1	3	150		0.8	0.8	125		0.8	B4	T
C135	042 300 000	A	1.4	1	150		1.5	1	150		1	B4	T
C142	542 300 000	A	1	1.5	150	75	1.7	0.8	100		0.8	B4	P
C243	642 350 000		2	15	150	150	17	1.5	100	100	1.5	B5	P
C243N	642 350 000		2	4.5	150	125	6	2.2	150	100	2.2	B5	P
C243N	264 530 000		2	4.5	150	125	6	2.2	150	100	2.2	UX5	P
C405	642 300 000		4	32	250		20	1.9	100		1.9	B4	T
C405	264 300 000		4	32	250		20	1.9	100		1.9	UX4	T
C408	642 300 000		4	7	150		14	2.9	100		2.9	B4	T
C443	642 350 000		4	25	300	200	20	1.7	100	PenLF	1.7	B5	P
C443N	642 350 000		4	42	300	200	20	1.5	100	PenLF	1.5	B5	P
C443N/S	642 350 000		4	20	300	150	20	1.5	100	100	1.5	B5	P
C453	642 350 000		4	25	300	200	20	1.7	100	PenLF	1.7	B5	P
C508	264 300 000		5	9	150		6.2	1.7	100		1.7	UX4	T
C509A	642 300 000		4	10	150		10	1	100		1	B4	T
C603	642 300 000		6	40	175		20	1.7	100		1.7	B4	T
C606	642 300 000		6	27	250		20	3.3	100		3.5	B4	T
C643	642 350 000		6	21	300	200	20	1.5	100	PenLF	1.5	B5	P
DACI	023 089 060	G <sub>1</sub>	1.4	1	90		0.14	0.27	90		0.27	8SC	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE	
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V			
TH	207 540 630	G <sub>1</sub>	1.4	{ 0 0	60 90	60	2.1 1	1.4	No Data Available			A08	DCH21	
TH	276 454 030		1.4	{ 0 0	60 90	50	1.4 0.75	No Data Available			A08			DCH22
TH	276 454 030		1.4	{ 0 0	60 90	60	2 1	1.3	No Data Available					
P	642 310 000	S	35	10	250	200	30	2.5	100	PenLF	2.5	B5	DC2/Pen	
T	402 320 060		1.2	0	150		20	3.5	No Data Available			B9A	DC80	

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
DAC2I	206 008 030	G <sub>1</sub>	1.4	I	90		0.5	0.3	80		0.3	A08	DT
DAC25	264 228 230		1.4	I	125		0.6	0.35	125		0.35	A08	DT
DAC3I	036 080 200	G <sub>1</sub>	1.4	I	90		0.45	0.27	80		0.27	A08	DT
DAC32	036 080 200	G <sub>1</sub>	1.4	I	90		0.15	0.27	80		0.27	A08	DT
DAF40	268 354 230		1.4	4	75	75	0.85	0.7	80	75	0.8	B8A	DP
DAF4I	268 354 230		1.4		75	75	0.85	0.7	80	75	0.8	B8A	DP
DAF9I	208 564 300		1.4	I	90	90	2.7	0.72	80	90	0.72	B7G	DP
DASI	542 300 000	A	2	2.7	125	125	1.5	0.58	100	100	0.58	Sm4	P
DA	000 231 600	G <sub>1</sub>	13	2.6	200		3.7	2.2	150		2.2	B7	T
DAI	642 300 000		2	I	40		0.25	0.4	No Data Available			Sm4	T
DA2	642 300 000		2	2.15	40		1.25	0.5	No Data Available			Sm4	T
DA3	642 300 000		2	2.8	40		1.8	0.62	No Data Available			Sm4	T
DA30	642 300 000		4	I	100			6.9	100		6.0	B5	T
DA90	281 0*8 300		1.4				5		D			B7G	R
DA406	542 300 000	A	4	2.5	150	75	3	0.8	100	75	0.8	B4	P
DB	446 230 700		25	0	250		40		250			B7	TT
DBC2I	206 098 030	G <sub>1</sub>	1.4	1.5	125		1.6	0.9	100		0.9	A08	DDT
DBC3I	026 980 300		1.4	1.5	125		1.6	0.9	100		0.9	A08	DDT
DCC90	274 346 200		1.4	2.5	90		2.7	1.8	80		1.8	B7G	TT
DC/HL	642 310 000		6	I	100			3	100		3	B5	T
DC/P	642 310 000		8	I	200			4.5	200		4.5	B5	T
DC/SG	542 310 000	A	6		200	75		2.75	200	75	2.75	B5	P
DC2/HLDD	809 231 600	G <sub>1</sub>	25	I	200			2	200		2	B7	DDT
DC2P	642 310 000		35	13.5	200		17	3.75	200		3.75	B5	T
DC2/Pen	045 231 600		35	10	250	200	30	2.5	100	PenLF	2.5	B7	P
DC2SG	542 310 000	A	20	I	200	75	5.5	1.8	200	75	1.8	B5	P
DC2SGVM	542 310 000	A	20	2	200	60	5.8	1.5	200	60	1.5	B5	P
DC3HL	642 310 000		25	I	80		0.34	0.38	80		0.38	B5	T
DC25	260 024 030		1.4	3.5	100		1.8	0.85	100		0.85	B8B	T
DDD25	206 447 030		1.4	1.5	100		3.5	1.2	100		1.2	A08	TT
DDL4	892 310 000		4				5		D			B5	RR
DDP4B	968 231 500	G <sub>1</sub>	4	5	250	250	36	8	100	PenLF	7	B7	DDP
DDP4M	918 236 500	G <sub>1</sub>	4	5	250	250	36	8	100	PenLF	7	B7	DDP
DD/Pen	849 231 500	A	4	2.5	200	100	5	2.7	100	100	2.7	B7	P
DDPP4B	869 231 500	G <sub>1</sub>	4	5	250	250	36	10	100	PenLF	9	B7	DDP
DDPP4BS	023 189 560	G <sub>1</sub>	4	5	250	250	36	10	100	PenLF	9	8SC	DDP
DDPP4M	869 231 500	G <sub>1</sub>	4	5	250	250	36	10	100	PenLF	9	B7	P
DDPP6B	968 231 500	G <sub>1</sub>	6	6	250	250	36	9.5	100	PenLF	9	B7	DDP
DDPP39	968 231 500	G <sub>1</sub>	35	8	200	200	45	8.5	100	PenLF	8	B7	DDP
DDPP39M	918 236 500	G <sub>1</sub>	35	8	200	200	45	8.5	100	PenLF	8	B7	DDP
DDPP39S	023 198 560	G <sub>1</sub>	35	8	200	200	45	8.5	100	PenLF	8	8SC	DDP
DDT	908 231 600	G <sub>1</sub>	4	3	200		3	2.4	150		2.4	B7	DDT
DDT2	682 390 000	G <sub>1</sub>	2	3	150		1	1.4	100		1.4	B5	DDT
DDT2B	682 390 000	G <sub>1</sub>	2	4.5	150		2.5	1	100		1	B5	DDT
DDT2BS	023 089 060	G <sub>1</sub>	2	4.5	150		2.5	1	100		1	8SC	DDT



TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

T	020 000 310	A <sub>1</sub> G <sub>1</sub>	6	5.5	250		12	3	100		3	A08	DET20
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
DDT4	809 231 600	G <sub>1</sub>	4	3	200		3	2.5	150		2.5	B7	DDT
DDT4(S)	908 231 600	G <sub>1</sub>	4	5	250		4	3.6	150		3.6	B7	DDT
DDT4(S)	023 198 060	G <sub>1</sub>	4	5	250		4	3.6	150		3.6	8SC	DDT
DDT6	809 231 600	G <sub>1</sub>	6	5.5	250		5	2	150		2	B7	DDT
DDT6S	023 189 060	G <sub>1</sub>	6	5.5	250		5	2	150		2	8SC	DDT
DDT13	908 231 600	G <sub>1</sub>	13	4	200		5	2.3	150		2.3	B7	DDT
DDT13S	023 189 060	G <sub>1</sub>	13	5	200		4	3.6	100		3.6	8SC	DDT
DDT16	809 231 600	G <sub>1</sub>	16	3	200		5	2.5	100		2.5	B7	DDT
DDT215	682 390 000	G <sub>1</sub>	2	3	150		3	1.6	100		1.6	B5	DDT
DDT220	682 390 000	G <sub>1</sub>	2.5	4.5	150		2.5	1	100		1	B5	DDT
DD4	892 310 000		4						D			B5	DD
DD4D	091 231 800		4						D			B7	DD
DD6	892 310 000		6						D			B5	DD
DD6	192 310 800		6				5		D			B7G	RR
DD6G	192 310 800		6				5		D			B7G	RR
DD13	892 310 000		13						D			B5	DD
DD41	219 080 130		4						D			M08	DD
DD101	219 080 130		10						D			M08	DD
DD207	892 300 000		2						D			B4	DD
DD465	902 310 000	D <sub>1</sub>	4						D			B5	DD
DD620	892 310 000		6						D			B5	DD
DD818	892 310 000		8						D			B5	DD
DET19	204 140 300	A <sub>1</sub> A <sub>2</sub>	6.0		300		25	2.1	100		2.1	UX7	T
DE1	264 130 000		2.5	21	250		5.2	0.975	100		0.975	UX5	T
DE5	280 300 000		2.5				120		REC			UX4	R
DFF50	246 557 430		1.4	11	20	20	22.5	1.2	No Data Available			A08	PP
DFF51	246 557 430		1.4	1	20	20	2.1	0.7	No Data Available			A08	PP
DFF101	634 572 400		1.4		40	40	1	0.22	No Data Available			B7G	PP
DF1	032 000 560	G <sub>1</sub>	1.4	1	90	90	1.2	0.75	80	90	0.75	8SC	P
DF21	206 501 030	G <sub>1</sub>	1.4	1	90	90	1.2	0.7	80	90	0.7	A08	
DF22	206 501 030	G <sub>1</sub>	1.4	1.5	90	90	1.4	1.1	80	90	1.1	A08	P
DF23	265 114 130		1.4	1.5	90	60	0.65	0.58	80	60	0.58	A08	P
DF25	265 114 130		1.4	1	125	60	1	0.65	125	60	0.65	A08	P
DF26	265 114 130		1.4	1.1	125	90	1.2	0.3	125	90	0.3	A08	P
DF31	026 510 300	G <sub>1</sub>	1.4	1	90	90	1.2	0.65	80	90	0.65	A08	P
DF32	026 510 300	G <sub>1</sub>	1.4	1.5	90	90	1.4	1.1	80	90	1.1	A08	P
DF33	036 500 200	G <sub>1</sub>	1.4	1	90	90	1.2	0.75	80	90	0.75	A08	P
DF91	265 024 300		1.4	1	90	75	3.5	0.9	80	60	0.9	B7G	P
DF92	265 024 300		1.4	1	90	75	3.7	1	80	60	1	B7G	P
DG210	642 350 000		2	1.5	100	20	1	1	No Data Available			B5	P
DH	642 310 000		16	3	200		6	3.7	100		3.7	B5	T
DHD	908 231 600	G <sub>1</sub>	16	1	200			2.2	200		2.2	B7	DDT
DHL	642 310 000		16	1.5	150		3.8	4.5	100		4.5	B5	T
DH30	908 231 600	G <sub>1</sub>	13	2	200		2.8	4.5	150		4.5	B7	DDT
DH42	908 231 600	G <sub>1</sub>	4	3	250		1.1	1.2	150		1.2	B7	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
DDT	026 890 310	G <sub>1</sub>	13	3	250		1.1	1.2	100		1.2	A08	DH74
DDT	412 389 600		19	3	250		1	1.2	150		1.2	B7G	DH107
DDT	264 089 130		14		175		1.5	1.65	100		1.6	B8A	DH142
DDT	026 890 310	G <sub>1</sub>	6	5.5	250		5	2	100		2	A08	DH147
DDT	264 089 130		6		250		1	1.3	100		1.3	B8A	DH150
H	206 540 530	G <sub>1</sub>	1.4	0	90	60	1.5		80	60		A08	DK21
O	264 554 030		1.4	0	75	75	0.9		No Data Available			B8A	DK40
P	265 204 330		1.4	4.7	125	125	4.5	2.1	100	100	2.1	A08	DL25

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
DH63	026 890 310	G <sub>1</sub>	6	3	250		1.1	1.2	150		1.2	A08	DDT
DH73	026 890 310	G <sub>1</sub>	6	1	250			2	250		2	A08	DDT
DH76	026 980 310	G <sub>1</sub>	13	3	250		1.1	1.2	150		1.2	A08	DDT
DH77	412 389 600		6	3	250		1	1.2	150		1.2	B7G	DDT
DH81	264 *98 130		6	3	250		1	1.2	150		1.2	B8B	DDT
DH101	264 *98 130		19	3	250		1	1.2	150		1.2	B8B	DDT
DH149	264 198 130		6	1	250		2.3	1	250		1	B8B	DDT
DK1	023 064 560	G <sub>1</sub>	1.4	0	90	50	1.8	0.55	80	60	0.55	8SC	H
DK32	036 546 200	G <sub>1</sub>	1.4	0	90	50	1.8	0.55	80	60	0.55	A08	H
DK91	266 424 300		1.4	0	75			1.4	80		1.4	B7G	H
DL	642 310 000		16	8	200		25	4.5	100		4.5	B5	T
DLL21	246 547 330		1.4	8.7	125	125	1		100	100		A08	PP
DLL101	264 574 300		1.4		90	60	4.5	1.2	80	60	1.2	B7G	PP
DLL102	264 475 300		1.4		40	40	1.3	0.55	No Data Available			B7G	PP
DLI	023 004 560		1.4	3	90	90	4	1.25	80	75	1.25	8SC	P
DL2	032 004 560		1.4	7.5	90	90	7.5	1.55	80	75	1.55	8SC	P
DL21	206 540 030		1.4	3	90	90	4	1.3	80	90	1.3	A08	P
DL22	265 024 330		1.4	4	125	125	5	1.6	100	100	1.6	A08	P
DL31	036 540 200		1.4	3	90	90	4	1.25	80	75	1.25	A08	P
DL33	036 540 320		1.4	4.5	90	90	9.5	2.2	80	75	2.2	A08	P
DL35	036 540 200		1.4	7.5	90	90	7.5	1.55	80	75	1.55	A08	P
DL41	362 054 220		1.4	3	90	90	4	1.3	80	90	1.3	B8A	P
DL63	026 890 310	G <sub>1</sub>	6	3	250		4.2	1.6	100		1.6	A08	DDT
DL74	026 890 310	G <sub>1</sub>	13	3	250		5.1	1.65	100		1.65	A08	DDT
DL82	264 *98 130		6.0	2	200		10	1.4	150		1.4	B8B	DDT
DL92	264 536 200		1.4	7	90	90	7.4	1.58	80	75	1.58	B7G	P
DL93	365 426 300		1.4	8.4	150	90	13.3	1.9	100	75	1.9	B7G	P
DL94	365 024 300		1.4	4.5	90	90	9.5	2.15	80	75	2.15	B7G	P
DL145	264 098 130		15	5.9	250		5	2.3	150		2.3	B8A	DDT
DN41	968 231 500	G <sub>1</sub>	4	3.3	250	200	32	10	100	PenLF	9	B7	DDP
DN143	264 598 130		6	6.2	250	275	44	9.5	100	PenLF	9	B8B	DDP
DP	264 008 030		16	7.5	200		25	6	100		6	M08	DT
DP5	642 350 000		4	5	250	250	10	4	100	PenLF	4	B5	P
DP7	023 004 560		4	20	250	250	20	2.5	100	PenLF	2.5	8SC	P
DP/Pen	045 231 600		16	10	200	200	31	3.5	100	100	3.5	B7	P
DPT	045 231 600		16	10	200	200	40	3	100	PenLF	3	B7	P
DP495/6	869 231 500	G <sub>1</sub>	4	6.5	250	250	35		100	PenLF		B7	DDP
DP4480	819 236 500	G <sub>1</sub>	44	8.4	200	200	46	8	100	PenLF	7	B7	DDP
DS	000 231 600	G <sub>1</sub>	13	3	200		4	2.5	150		2.5	B7	T
DSB	542 310 000	A	16	1	150	90	3.4	3.2	150	90	3.2	B5	P
DSPen	061 231 500	G <sub>1</sub>	16	1.5	200	100	4.7	2.3	200	100	2.3	B7	P
DT7	642 300 000		4	16	200		14	2	100		2	B4	T
DT436	023 198 060	G <sub>1</sub>	4	7	250		4	2	100		2	8SC	DDT
DT1366	023 198 060	G <sub>1</sub>	13	5	200		4	2	100		2	8SC	DDT
DVSG	542 310 000	A	16	1	200	75	7.5	2.5	100	75	2.5	B5	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

R	28I 380 000		6				5		No Data Available			M5	EA76
DDT	023 189 060	G <sub>1</sub>	6	4.3	200		4	2	150		2	8SC	EBC30

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
DVS Pen	542 310 000	A	16	1.5	200	100	5.5	2	200	100	2	B5	P
DW2	892 300 000		4				30		REC		15mA	B4	RR
DW3	892 300 000		4				30		REC		15mA	B4	RR
DW4	892 300 000		4				60		REC		20mA	B4	RR
DW4/350	892 300 000		4				60		REC		20mA	B4	RR
DW4/500	892 300 000		4				60		REC		20mA	B4	RR
DW802	642 300 000		4	25	250		26	4	100		4	B5	T
DW1508	642 310 000		4	7.5	150		4	1.5	100		1.5	B5	T
DW4011	642 310 000		4	5	200		5	3.6	150		3.6	B5	T
DW4023	642 310 000		4	3	150		2.5	1.75	100		1.7	B4	T
DX2	642 300 000		2	3	150		3.5	1.4	100		1.4	B4	T
DY604	642 300 000		4	15	150		8	1.3	100		1.3	B4	T
DZ2	542 300 000	A	4	1	200	100	4	0.7	100	100	4	B4	P
D1	123 000 000	D <sub>1</sub>	4				5		D			B3G	R
D1	642 300 000		4	1	40		1	0.8	No Data Available			B4	T
D1	289 300 000		5				60		REC		20mA	UX4	RR
D2	642 300 000		4	6	100		2.2	0.25	100		0.25	B4	T
D4	642 310 000		4	3	200		4	3.3	150		3.3	B5	T
D020	642 300 000		7.5	50	400		55	2.1	100		2.1	B4	T
D024	642 300 000		4	40	400		63	7.5	100		6.0	B4	T
D025	642 300 000		6	100	400		63	3.75	100		3.75	B4	T
D026	642 300 000		4	92	400		63	3.8	100		3.8	B4	T
D030	642 300 000		4	100	400		60	6.9	100		6.0	B4	T
D41	892 310 000		4						D			B5	DD
D42	812 300 000		4						D			B4	D
D43	102 300 000	D <sub>1</sub>	4						D			B4	D
D63	029 180 310		6						D			A08	DD
D77	192 310 800		6					5	D			B7G	RR
D110	264 300 000		4	40	250		40	2.7	100		2.7	UX4	T
D110	642 300 000		4	40	250		40	2.7	100		2.7	B4	T
D210	642 300 000		2	3	150		3.5	1.25	100		1.25	B4	T
D210SW	603 200 000	G <sub>1</sub>	2	4.5	150		2.4	1.35	100		1.35	B4	T
D243	642 350 000		2.5	27	300	200	20	2	100	PenLF	2	B5	T
D404	642 300 000		4	10	100		4	0.45	100		0.45	B4	T
D410	642 300 000		4	3	150		3.5	0.5	150		0.5	B4	T
D418	102 300 000	D <sub>1</sub>	4						D			B4	D
E	642 300 000		4	9	200		1.7	0.4	100		0.4	B4	T
EAB1	023 110 890		6						D			8SC	DDD
EAC91	012 314 600		6	2.8	200		7.5	2.8	100		2.8	B7G	DT
EA41	268 154 130		6	2	250	100	5	1.8	100	100	1.8	B8A	DP
EA42	268 154 130		6	2	250	100	5	1.8	100	100	1.8	B8A	DP
EA40	200 800 130		6						D			B8A	D
EA50	123 000 000	D <sub>1</sub>	6						D			B3G	D
EBC1	023 198 060	G <sub>1</sub>	6	7	250		4	2	100		2	8SC	DDT
EBC3	023 189 060	G <sub>1</sub>	6	5.5	250		5	2	100		2	8SC	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

DDP	026 895 310	G <sub>1</sub>	6	2	250	100	5	1·8	100	100	1·8	A08	EBF32
DDP	216 589 130	G <sub>1</sub>	6	2	250	100	5	1·8	100	100	1·8	A08	EBF35

TT	741 226 413		6	1·5	200		10	5·5	150		5	B9A	ECC81
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T	244 664 413		6	1·5	250		10	9	100		7	B9G	EC54
T	462 603 160		6	2	100		13	5·5	100		5·5	M8	EC70
T	441 230 446		6	1·5	250		15	12	150		10	B9A	EC80
T	401 230 060		6	2	150		30	5·5	100		4	B9A	EC81



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
EBC33	026 890 310	G <sub>1</sub>	6	5.5	250		5	2	100		2	A08	DDT
EBC41	264 098 130		6	3	250		1	1.3	150		1.3	B8A	DDT
EBF1	023 198 560	G <sub>1</sub>	6	3	250	125	9	1.1	100	100	1.1	8SC	DDP
EBF2	032 198 560	G <sub>1</sub>	6	2	250	100	5	1.8	100	PenLF	1.8	8SC	DDP
EBF80	541 236 891		6	2	250	90	5	2.2	100	80	2.2	B9A	DDP
EBL1	023 189 560	G <sub>1</sub>	6	6	250	250	36	9.5	100	PenLF	9.0	8SC	DDP
EBL21	264 598 130		6	6.2	250	275	44	9.5	100	PenLF	9.0	B8B	DDP
EBL31	026 895 310	G <sub>1</sub>	6	6	250	250	36	9.5	100	PenLF	9.0	A08	DDP
EB4	023 180 910		6						D			8SC	DD
EB34	029 180 310		6						D			A08	DD
EB40	208 090 130		6						D			B8A	D
EB41	201 908 130		6				5		D			B8A	RR
EB91	192 310 800		6				5		D			B7G	RR
ECC31	027 446 310		6	4.6	250		6	2.3	100		2.3	A08	TT
ECC32	461 471 230		6	4.6	250		6	2.3	100		2.3	A08	TT
ECC33	461 471 230		6	4	250		9	3.6	100		3.6	A08	TT
ECC34	461 471 230		6	16	250		10	2.2	100		2.2	A08	TT
ECC35	461 471 230		6	2.3	250		2.3	2	100		2	A08	TT
ECC40	274 164 130		6	5.2	250		6	2.7	100		2.7	B8A	TT
ECC91	672 344 100		6	0.85	100		8.5	5.3	100		5.3	B7G	TT
ECF1	023 164 570	G <sub>1</sub>	6	{ 2 2 0	150 100 100	100	9 5 9.5	2.6 2.5 5.5	150 100 100	100	2.6 2.5 5.5	8SC	TP
ECH2	023 164 570	G <sub>1</sub>	6	{ 2.5 2 2	250 100 200	100	3.25 5 3	5.5 2.4 2.2	250 100 200	100	5.5 2.8 2.2	8SC	TH
ECH3	023 164 570	G <sub>1</sub>	6	{ 2 2 2	100 200 250	100	5 3 3	2.4 2.2 2.2	100 200 100	100	2.8 2.2 2.2	8SC	TH
ECH4	123 614 570	G <sub>1</sub>	6	{ 2 2 0	250 250 100	100	5.3 3 12	2.2 2.2 3.2	100 100 100	PenLF	2.2 3.2 2.2	8SC	TH
ECH21	276 454 131		6	{ 2 2 2	250 250 250	90	5.3 5.3 5.3	2.2 2.2 2.2	100 100 100	90	2.2 2.2 2.2	B8B	TH
ECH33	027 546 310	G <sub>1</sub>	6	{ 2 2 2	100 200 100	100	5 3 5.4	2.4 2.2 2.2	100 100 100	100	2.8 2.8 2.8	A08	TH
ECH35	027 546 310	G <sub>1</sub>	6	{ 2 2 0	100 250 100	100	3 3 8.5	2.2 2.2 2.2	100 100 100	100	2.8 2.8 2.8	A08	TH
ECH41	276 454 130		6	{ 2 2 1	250 250 100	100	3 3 6.8	2.2 2.2 1.6	100 100 100	100	2.2 2.2 2.8	B8A	TH
ECH42	276 454 130		6	{ 2.5 2.3 8.0	250 100 200	100	2.6 4 17.5	2.6 1.4 3.3	100 100 100	100	2.6 1.4 3.3	B8A	TH
ECL80	641 237 154		6	{ 2.3 8.0	100 200	200	4 17.5	1.4 3.3	100 100	PenLF	1.4 3.0	B9A	TP
EC2	023 100 060	G <sub>1</sub>	6	5.5	250		6	2.5	100		1.5	8SC	T
EC31	026 040 310		6	16	150		20	3.2	100		3.2	A08	T
EC40	244 644 130		6	1.5	275		15	12	100		9	B8A	T
EC41	206 040 130		6	5.5	175		20	4.5	125		4.5	B8A	T
EC52	241 600 003		6	2.6	250		10	6.5	100		6.5	B9G	T
EC53	123 000 000	A G <sub>1</sub>	6	3.3	200		7.5	2.9	100		2.9	B3G	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
PP	265 414 573		6	2	250	200	6	8	100	PenLF	7	B9G	EFF51
P	026 510 310	G <sub>1</sub>	6	2	250	100	3	1·8	100	100	1·8	A08	EF37A
P	412 163 510		6	2	100	100	3	2·3	100	100	2·3	M8	EF70
P	412 163 510		6	2	100	100	13	5·5	100	100	5·5	M8	EF71
P	412 163 510		6	1·4	100	100	7	5	100	100	5	M8	EF72
P	412 653 160		6	2	100	100	7·5	5	100	100	5	M8	EF73
P	412 365 100		6	1	250	100	11·6	4·5	150	100	4	B7G	EF93
P	412 365 100		6	2·3	150	150	7	4·3	100	100	4	B7G	EF95
O	023 164 570	G <sub>1</sub>	6	{ 2	200		2·5		100			} 8SC	EK2
					250	50	1		100	60			

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
EC91	412 314 600		6	1.5	250		10	8.5	200		8.0	B7G	T
EFF50	265 414 573		6	2	250	200	6	8	100	PenLF	7	B9G	PP
EF1	023 110 560	G <sub>1</sub>	6	2	250	100	3	2.3	100	100	2.3	8SC	P
EF2	023 110 560	G <sub>1</sub>	6	2	250	100	4.5	2.2	100	100	2.2	8SC	P
EF3	023 110 560	G <sub>1</sub>	6	2.5	250	100	8	1.8	100	100	1.8	8SC	P
EF5	023 110 560	G <sub>1</sub>	6	3	250	100	8	1.7	100	100	1.7	8SC	P
EF6	023 110 560	G <sub>1</sub>	6	2	250	100	3	2	100	100	2	8SC	P
EF7	023 110 560	G <sub>1</sub>	6	1.5	250	100	3	2.1	100	100	2.1	8SC	P
EF8	023 111 560	G <sub>1</sub>	6	2.5	250	250	8	1.8	100	PenLF	1.8	8SC	P
EF9	023 110 560	G <sub>1</sub>	6	2.5	250	100	6	2.2	100	100	2.2	8SC	P
EF22	265 104 130		6	2.5	250	100	6	2.2	100	100	2.2	B8B	P
EF25	023 110 560	G <sub>1</sub>	6	2	250	100	5	1.8	100	100	1.8	8SC	P
EF36	026 510 310	G <sub>1</sub>	6	2	250	100	3	1.8	100	100	1.8	A08	P
EF37	026 510 310	G <sub>1</sub>	6	2	250	100	3	1.8	100	100	1.8	A08	P
EF38	126 510 310	G <sub>1</sub>	6	2.5	250	250	8	1.8	100	PenLF	1.8	A08	P
EF39	026 510 310	G <sub>1</sub>	6	2.5	250	100	6	2.2	100	100	2.2	A08	P
EF40	260 145 130		6	2	250	150	3	1.8	100	150	1.8	B8A	P
EF41	261 154 130		6	2.5	250	100	6	2.2	100	100	2.2	B8A	P
EF42	260 154 130		6	2	250	250	10	9.5	100	PenLF	8.0	B8A	P
EF50	256 101 403		6	1.55	250	250	10	6.5	100	PenLF	6.0	B9G	P
EF51	261 154 130		6	2	250	250	14	9.5	100	PenLF	9.0	B8B	P
EF54	265 114 113		6	1.7	250	250	10	7.7	100	PenLF	7.0	B9G	P
EF55	256 101 403		6	4	250	150	10	7	100	100	6	B9G	P
EF80	141 230 651		6	2	175	175	10	7.2	100	125	6	B9A	P
EF91	412 361 500		6	2	250	250	10	7.65	100	PenLF	7.0	B7G	P
EF92	412 361 500		6	2.5	250	200	8	2.5	100	PenLF	2.5	B7G	P
EH1	023 145 560	G <sub>1</sub>	6	2	250	80	3	1.8	200	75	1.8	8SC	P
EH2	023 115 560	G <sub>1</sub>	6	2	250	90	1.8		100	90		8SC	P
EK1	123 174 560	G <sub>1</sub>	6	1.5	90		2		80				
				8.5	250	75	1.6		100	75		8SC	O
EK3	023 164 570	G <sub>1</sub>	6	—	100		6		200			8SC	O
				2.5	250	100	2.5		100	60			
EK32	027 546 310	G <sub>1</sub>	6	—	200		2.5		100				
				2	250	50	1		100	60		A08	O
ELL1	423 174 560		6	21.5	250	250	15	1.8	100	PenLF	1.8	8SC	PP
EL1	023 100 560	G <sub>1</sub>	6	18.5	250	250	32	2.6	100	PenLF	2.6	8SC	P
EL2	023 100 560	G <sub>1</sub>	6	18	250	250	32	2.8	100	PenLF	2.8	8SC	P
EL3	023 104 560		6	6	250	250	36	9	100	PenLF	9	8SC	P
EL5	023 104 560		6	14	250	275	72	8.5	100	PenLF	8.5	8SC	P
EL6	023 104 560		6	7	250	250	72	14.5	100	PenLF	10	8SC	P
EL20	265 104 130		6	34	300	300	12.5		100	100		B8B	P
EL22	265 004 130		6	7	250	250	44	9.5	100	PenLF	9	B8B	P
EL31	120 540 310	A	6	9	300	275	91	14	100	PenLF	10	A08	P
EL32	026 500 310	G <sub>1</sub>	6	18	250	250	32	3.8	100	PenLF	3.8	A08	P
EL33	026 540 310		6	6	250	250	36	9	100	PenLF	8	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	412 163 510		6	9	100	100	31	2.2	100	90	2.2	M8	EL70
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R	082 813 080		6				30		Rec		17mA	M8	EY70
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
EL34	026 540 310		6		250	250	100	11	100	100	9	B8A	P
EL35	026 540 310		6	15.5	250	250	72	5	100	PenLF	5	A08	P
EL36	026 540 310		6	7	250	250	72	14.5	100	PenLF	10	A08	P
EL37	026 540 310		6	13.5	250	250	100	11	100	PenLF	10	A08	P
EL38	120 540 310	A	6	7	250	250	100	14.3	100	PenLF	10	A08	P
EL41	261 054 130		6	7	250	250	36	10	100	PenLF	8	B8A	P
EL42	261 054 130		6	10	225	225	26	3.2	100	PenLF	3.2	B8A	P
EL43	260 154 130		6	3	250	250	36	10	100	PenLF	8	B8A	P
EL44	200 154 130	A	6		250	250	20	5	100	PenLF	5	B8A	P
EL50	023 114 500	A	6	14	250	275	72	8.5	100	PenLF	8	8SC	P
EL91	412 360 500		6	12.4	250	250	16	2.6	100	PenLF	2.6	B7G	P
EQ80	541 236 114		6	1	250	20	0.95	0.7	No Data	Available		B9A	N
ER4	002 300 000	D <sub>1</sub>	4				3					B4	D
EW60	280 000 103		6				120		REC		30mA	B9G	RR
EY91	812 380 000		6				60		REC		20mA	B7G	R
EZ1	023 180 090		6				30		REC		15mA	8SC	RR
EZ2	023 180 090		6				30		REC		15mA	8SC	RR
EZ3	023 180 090		6				60		REC		20mA	8SC	RR
EZ4	023 180 090		6				60		REC		20mA	8SC	RR
EZ22	208 009 130		6				60		REC		20mA	B8B	RR
EZ33	028 090 310		6				60		REC		20mA	A08	RR
EZ35	028 090 310		6				30		REC		15mA	A08	RR
EZ40	280 009 130		6				30		REC		15mA	B8A	RR
EZ41	280 009 130		6				30		REC		15mA	B8A	RR
E4K	003 200 000	D <sub>1</sub>	4				60		REC		20mA	B5	R
E4L	003 200 000	D <sub>1</sub>	4				120		REC		30mA	B5	R
E235	642 300 000		2	12	200		18	3	100		3	B4	T
E405	642 300 000		4	32	250		20	2	100		2	B4	T
E406	642 300 000		4	34	250		8	2.3	100		2.3	B4	T
E406N	642 300 000		4	34	250		8	2.3	100		2.3	B4	T
E408	642 300 000		4	30	400		26	2	100		2	B4	T
E408N	642 300 000		4	36	400		30	2.7	100		2	B4	T
E409	642 310 000		4	16	200		12	1.3	100		1.3	B5	T
E409N	642 310 000		4	16	200		12	1.3	100		1.3	B5	T
E410	642 300 000		4	28	400		30	6	100		6	B4	T
E414	642 310 000		4	6	150		6.5	2	100		2	B5	T
E414	642 300 000		4	15	150		8	1.3	100		1.3	B4	T
E415	642 310 000		4	8	200		6	1.4	100		1.4	B5	T
E415	264 130 000		4	8	200		6	1.4	100		1.4	UX5	T
E420	642 300 000		4	18	150		11	1.6	100		1.6	B4	T
E422	642 300 000		4	16	250		12	5	100		5	B4	T
E424	642 310 000		4	3.5	200		6	2.4	100		2.4	B5	T
E424R	612 300 000	G <sub>1</sub>	4	5	200		6	1.6	100		1.6	B4	T
E424N	642 310 000		4	3.5	200		6	2.4	100		2.4	B5	T
E425	642 310 000		4	4.5	150		3	1	100		1	B5	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

T	366 446 622		6	2-3	250		32	16	No Data Available			B9G	EI 137
P	020 450 310	A	6	11	250	150	30	3.5	100	100	3.5	A08	EI 192
T	020 000 310	A G <sub>1</sub>	6	3	100		25	6.7	100		6	A08	EI 323
DP	208 564 300		1.4	1	90	90	2.7	0.63	80	90	0.6	B7G	EI 484
PP	241 657 143		6		350	250	21	3.9	100	100	3.9	B9G	EI 489
P	412 361 500		6	2	250	250	10	7.5	100	150	5	B7G	EI 518
P	026 510 310	G <sub>1</sub>	6	1.5	200	200	10.9	8.5	100	150	8	A08	EI 654

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
E428	642 310 000		4	3.5	200			2.4	100		2.4	B5	T
E430	642 310 000		4	3	150		4	2	100		2	B5	T
E430N	642 310 000		4	15	200		15	3	100		3	B5	T
E435	642 310 000		4	1.5	200		3	3	100		3	B5	T
E438	642 310 000		4	2.5	200		0.3	1.5	100		1.5	B5	T
E441N	652 300 000	G <sub>1</sub>	4	0	100	0	1.7	1	100		1	B4	T
E442	542 310 000	A	4	1.3	200	60	1.5	0.9	200	60	0.9	B5	P
E442S	542 310 000	A	4	2	200	60	4	1	100	60	1	B5	P
E443H	642 350 000		4	15	250	250	36	2.8	100	PenLF	2.8	B5	P
E443N	642 350 000		4	40	400	200	30	1.9	100	100	1.9	B5	P
E444S	642 310 000	D <sub>1</sub>	4	3.5	200		6	2	100		2	B5	DT
E445	542 310 000	A	4	2	200	100	6	1	100	100	1	B5	P
E446	542 310 000	A	4	2	200	100	3	2.3	100	100	2.3	B5	P
E447	542 310 000	A	4	2	200	125	4.5	2.3	100	100	2.3	B5	P
E448	164 552 300	G <sub>1</sub>	4	1.5	200	100	3		100	100		C7	P
E449	165 452 300	G <sub>1</sub>	4	2	200	75	3	1.8	100	75	1.8	C7	P
E452T	542 310 000	A	4	2	200	100	3	2	100	100	2	B5	P
E452T	254 130 000	A	4	2	200	100	3	2	100	100	2	UX5	P
E453	045 231 600		4	15	250	250	24	2.5	100	PenLF	2.5	B7	P
E454	216 809 300	G <sub>1</sub>	4	3.5	200		3.5	1.6	100		1.6	UX7	DDT
E455	542 310 000	A	4	1.5	200	100	3	2	100	100	2	B5	P
E455	254 130 000	A	4	1.5	200	100	3	2	100	100	2	UX5	P
E462	542 310 000	A	4	2	200	100	3	2	100	100	2	B5	P
E463	045 231 600		4	22	250	250	36	2.7	100	PenLF	2.7	B7	P
E499	642 310 000		4	1.6	200		0.2	4	150		4	B5	T
E543	045 231 600		4	15	250	250	24	2.5	100	PenLF	2.5	B7	P
E646	020 080 310		26				120		REC		30mA	A08	R
E703	642 300 000		7.5	100	400		30	1	100		1	B5	T
E851	030 908 020		5				120		REC		30mA	A08	RR
E1148	020 000 310	G <sub>1</sub> A	6	5.5	250		14	3	100		3	A08	T
E1413	265 024 300		1.4	1	90	75	3.5	0.9	80	75	0.9	B7G	P
E1478	642 300 000		4	1	100			6.9	100		6.0	B5	T
E1517	412 361 500		6	2.5	200	200	8	2.5	100	100	2.5	B7G	P
E1606	461 471 230		6	8	250		9	2.6	100		2.6	A08	TT
E1624	6*2 364 100		6	8.5	250		10.5	2.2	100		2.2	B7G	T
E1662	412 360 500		6	12	250	250	20	2.6	100	PenLF	2.6	B7G	P
E1677	002 300 000	D <sub>1</sub>	2				15		REC		10mA	B4	R
E1678	026 510 310	G <sub>1</sub>	13	3	250	100	7.6	1.5	100	100	1.5	B7G	P
E1681	026 540 310		15	13	175	175	35	2.5	100	100	2.5	A08	P
E1682	020 800 310		30				120		REC		30mA	A08	R
E1706	256 041 463		6	8	250	175	80	13	100	100	10	B9G	P
E1709	064 471 230		6	2	250		2	1.35	150		1.3	0	TT
E1733	009 **8 230		6				60		REC		20mA	B8B	RR
E1736	265 004 130		6	4.4	250	250	40	10.5	100	PenLF	10.0	B8B	P
E1740	209 008 130		6				30		REC		15mA	B8B	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	364 526 300		1.4	7	90	75	7.4	1.575	80	60	1.5	B7G	E1816
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RR	902 308 100		6				30		Rec		15mA	B7G	E2122
T	026 040 310		6	8	250		9	2.6	100		2.6	A08	E2185



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
E1751	192 310 800		6				5		D			B7G	RR
E1780	009 **8 230		4				30		REC		15mA	B8B	RR
E1787C	316 541 120		6	9	250	175	50	8	100	100	8	B9G	P
E1794	265 104 130		19	3	250	75	2.5	2.8	100	60	2.8	B8B	P
E1795	280 008 130		50				120		REC		30mA	B8B	R
E1796	265 004 130		80	9.5	175	175	70	10	100	100	9	B8B	P
E1809	265 104 136		6	3	250	100	8	2.8	100	100	2.8	B8B	P
E1813	264 198 130		19	3	250		1	1.2	100		1.2	B8B	DDT
E1835	005 231 600	G <sub>1</sub>	13	4.4	250	250	40	10.5	100	PenLF	9	B7	P
E1838	264 198 130		6	3	250		1	1.2	100		1.2	B8B	DDT
E1848	264 *98 130		6	2	200		10	1.4	200		1.4	B8B	DDT
E1884	002 300 000	D <sub>1</sub>	2				5		D			B4	R
E1912	412 389 600		6	3	250		1	1.2	100		1.2	B7G	DDT
E1938	802 309 100		6				30		REC		15mA	B7G	RR
E1969	542 376 400		6	{ 0 0	100 250	75	10 9	2.8	100 250	75	2.8	B7G	TH
E1976	412 361 500		19	2.5	200	200	8	2.5	100	150	2.5	B7G	P
E1984	412 36* 500		6	5.5	250	250	35	10	100	PenLF	9	B7G	P
E1985	281 008 300		40				60		REC		20mA	B7G	R
E1987	412 36* 500		40	8	175	150	50	10	100	100	9	B7G	P
E1994	471 461 230		13	8	250			2.6	100		2.6	A08	TT
E2020N	642 310 000		20	18	200		15	1.6	100		1.6	B5	T
E2047	412 361 500		12.5	2.5	200	200	8	2.5	200	200	2.5	B7G	P
FC2	645 230 700	G <sub>1</sub>	2	{ 0 0	150 150	50 75	2	0.95	150	60 75		B7	O
FC2A	645 230 700	G <sub>1</sub>	2	{ 0 0	150 150	50 50	2.1 0.7		150	60 60		87	O
FC4	645 231 700	G <sub>1</sub>	4	{ 4 4	90 250	90 90	2.0 1.6	1	100 250	90 90	1.3 1.5	B7	O
FC13	023 164 570	G <sub>1</sub>	13	{ — 1.5	90 200	75	2 1.6		90 200	75 75		8SC	O
FC13c	645 231 700	G <sub>1</sub>	13	{ — 1.5	90 200	75	2.0 1.6		90 200	75 75		B7	O
FC141	207 640 530		1.4		90	90	0.55		90	90		M08	H
FH2118	165 452 300	G <sub>1</sub>	20	2	200	80	3		100	75		C7	P
FW1	893 200 000		4				30		REC		15mA	B4	RR
FW3	892 300 000		4				60		REC		20mA	B4	RR
FW4/500	982 300 000		4				120		REC		30mA	B5	RR
FW4/800	982 300 000		4				60		REC		20mA	B5	RR
FY	642 350 000		4	10	250	250	32	5	100	PenLF	5	B5	P
FZ1	023 180 090		13				30		REC		15mA	8SC	RR
F5	642 300 000		4	40	300		40	6	100		6	B4	T
F10	642 300 000		4	15	300		30	5.5	100		5.5	B4	T
F100	642 350 000		4	16	250	250	42	2.5	100	PenLF	2.5	B5	P
F203	642 300 000		2.5	5.6	275		36	2	150		2	B4	T
F209(A)	642 310 000		2.5	21	250		5	1	100		1	B5	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

RR	28* **9 I30		5				30		Rec		17mA	B8A	GZ40
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T	023 100 060	G <sub>1</sub>	I3	3·7	200		5	3·3	150		3	8SC	HL13
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
F215	264 130 000	G <sub>1</sub>	2.5	6	150		6.5	2	100		2	UX5	T
F215	642 310 000		2.5	6	150		6.5	2	100		2	B5	T
F242	265 130 000		2.5	1.3	200	100	1.5	0.9	200	100	0.9	UX5	P
F410	642 300 000		4	15	275		13.5	2.8	100		2.8	B4	T
F443	642 350 000		4	30	400	200	45	3.2	100	100	3.2	B5	P
F443N	642 350 000		4	30	400	200	45	3.2	100	100	3.2	B5	P
F460	642 310 000		4	2	250		10	5.5	200		5.5	B5	T
F704	642 300 000		7.5	84	400		55	2.1	100		2.1	B5	T
F707	642 300 000		7.5	84	400		55	2.1	100		2.1	B4	T
F707	264 300 000		7.5	84	400		55	2.1	100		2.1	UX4	T
F708	264 300 000		7.5		400		30	1.6	100		1.6	UX4	T
GR4	892 300 000		4				120		REC		30mA	B4	RR
GR4	280 300 000		2.5				60		REC		20mA	UX4	R
G4100	802 300 000		4				120		REC		30mA	B4	R
G4150	892 300 000		4				60		REC		20mA	B4	RR
GZ32	030 809 020	G <sub>1</sub>	5				60		REC		20mA	A08	RR
HAD	908 231 600		13	2.5	200		3.3	2	150		2	B7	DDT
HD2	642 300 000		2	5	200		5	1	150		1	B4	T
HD14	036 080 200	G <sub>1</sub>	1.4	1	100		0.14	0.28	100		0.28	A08	DT
HD21	682 390 000	G <sub>1</sub>	2	1.5	150		1.8	1.5	150		1.5	B4	DDT
HD22	682 390 000	G <sub>1</sub>	2	3	150		1.8	1.5	100		1.5	B5	DDT
HD23	682 390 000	G <sub>1</sub>	2	3	250		1	1.4	125		1.4	B5	DDT
HD24	682 390 000	G <sub>1</sub>	2	1.5	150		2.7	1.4	125		1.4	B5	DDT
HLA1	642 310 000		4	1	200		5	8	200		7	B5	T
HLA2	642 310 000		4	2.5	200		6	5.5	150		5.5	B5	T
HLBI	642 300 000	G <sub>1</sub>	2	3	150		2	1.5	100		1.5	B5	T
HL/DD1320	809 231 600		13	3	200		4.3	1.9	150		1.9	B7	DDT
HL2	642 300 000		2	1.5	150		2.2	1.5	150		1.5	B4	T
HL2	023 004 060		2	1.5	150		2.2	1.5	150		1.5	8SC	T
HL2K	642 300 000		2	1.5	150		2.2	1.5	150		1.5	B4	T
HL2S	023 004 060		2	1.5	150		2.2	1.5	150		1.5	8SC	T
HL3	206 040 030		2	1.5	125		0.5	1.5	125		1.5	M08	T
HL4	642 310 000		4	4.5	250		5	3.5	150		3.5	B5	T
HL4g	000 231 600	G <sub>1</sub>	4	4.5	250		5	3.5	150		3.5	B7	T
HL4gs	023 100 060	G <sub>1</sub>	4	4.5	250		5	3.5	150		3.5	8SC	T
HL13	000 231 600	G <sub>1</sub>	13	2.75	200		6	3.5	150		3.5	B7	T
HL13c	000 231 600	G <sub>1</sub>	13	2.7	200		5	3.3	150		3.3	B7	T
HL13g	023 004 060	G <sub>1</sub>	13	5.5	250		6	2.5	150		2.5	8SC	T
HL13s	023 100 060	G <sub>1</sub>	13	3	200		6	3.5	150		3.5	8SC	T
HL21	642 300 000		2	3	150		1.75	1.5	125		1.5	B4	T
HL21DD	682 390 000	G <sub>1</sub>	2	2	150		2	1.3	125		1.3	B5	DDT
HL22	020 604 030		2	2	150		2	1.3	125		1.3	M08	T
HL22DD	206 080 930	G <sub>1</sub>	2	2	150		2	1.3	125		1.3	M08	DDT
HL23	206 040 030		2	2.4	150		1.5	1.2	125		1.2	M08	DDT
HL23DD	206 080 930	G <sub>1</sub>	2	2.8	150		1.5	1.05	125		1.2	M08	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	041 231 500	A	4	2	250	100	8	2.7	100	100	2.7	B7	HP415
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
HL4I	216 040 030		4	4.5	250		7	3.1	150		3.1	M08	T
HL4IDD	216 090 830	G <sub>1</sub>	4	5.2	250		6	2.2	250		2.2	M08	DD
HL42DD	216 090 830	G <sub>1</sub>	4	5	200		7.5	2.5	200		1.85	M08	DD
HL133	216 000 030	G <sub>1</sub>	13	3.3	200		6	2.9	200		2.9	M08	T
HL133DD	216 090 830	G <sub>1</sub>	13	5.4	250		6	2.3	150		2.3	M08	DD
HL135	023 100 060	G <sub>1</sub>	13	3	200		6	3.5	150		3.5	8SC	T
HL210	642 300 000		2	1	100			0.7	100		0.7	B4	T
HL607	642 300 000		6	1	100			1	100		1	B4	T
HL1320	000 231 600	G <sub>1</sub>	13	3.3	200		6	3	150		3	B7	T
HP2	446 230 700		2	1	125		8.5		125			B7	TT
HP6	412 361 500		6	2	250	250	10	7.5	150	200	6.5	B7G	P
HP13	061 231 500	G <sub>1</sub>	13	1	250	100	8	3.5	250	100	3.5	B7	P
HP13s	023 110 560	G <sub>1</sub>	13	1	250	100	8	3.5	250	100	3.5	8SC	P
HP210	542 300 000	A	2	1.5	150	150	1.9	1.9	150	150	1.9	B4	P
HP210	041 230 500	A	2	1.5	150	150	1.9	1.9	150	150	1.9	B7	P
HP210C	041 230 500	A	2	1	150	150	1.9	1.9	150	150	1.9	B7	P
HP210nc	542 300 000	A	2	1	150	150	1.9	1.9	150	150	1.9	B4	P
HP210nc	041 230 500	A	2	1	150	150	1.9	1.9	150	150	1.9	B7	P
HP211C	041 230 500	A	2		150	150	2.6	1.7	150	150	1.7	B7	P
HP211	542 300 000	A	2	1	150	150	2.6	1.7	150	150	1.7	B4	P
HP211	041 230 500	A	2	1	150	150	2.6	1.7	150	150	1.7	B7	P
HP215	542 300 000	A	2	1.5	150	80	1.5	1.2	150	75	1.2	B4	P
HP215	041 230 500	A	2	1.5	150	80	1.5	1.2	150	75	1.2	B7	P
HP1018	160 152 300	G <sub>1</sub>	10		250	150	2.3	1.25	100	PenLF	1.25	C7	P
HP1118	160 152 300	G <sub>1</sub>	10	3	250	150	10.5	1.65	100	125	1.65	C7	P
HP2018	542 310 000	A	20	2	200	100	4	3.5	100	100	3.5	B5	P
HP2118	041 230 500	A	20	2	200	100	5	3.5	100	100	3.5	B7	P
HP2118	542 310 000	A	20	2	200	100	5	3.5	100	100	3.5	B5	P
HP4100	542 310 000	A	20	2	200	100	3	3.5	100	100	3.5	B5	P
HP4101	041 231 500	A	4	2	200	100	3.5	3.5	100	100	3.5	B7	P
HP4101	542 310 000	A	4	2	200	100	3.5	3.5	100	100	3.5	B5	P
HP4101c	542 310 000	A	4	2	200	100	3.5	2.8	100	100	2.8	B5	P
HP4101c	041 231 500	A	4	2	200	100	3.5	2.8	100	100	2.8	B7	P
HP4105	542 310 000	A	4	2	250	100	4.5	3	100	100	3	B5	P
HP4105	041 231 500	A	4	2	250	100	4.5	3	100	100	3	B7	P
HP4106	041 231 500	A	4	2	200	100	5	3.5	100	100	3.5	B7	P
HP4106	542 310 000	A	4	2	200	100	5	3.5	100	100	3.5	B5	P
HP4106C	041 231 500	A	4		200	100	5	3.5	100	100	3.5	B7	P
HP4106C	542 310 000	A	4		200	100	5	3.5	100	100	3.5	B5	P
HP4115	041 231 500	A	4	2	200	100	4.3	3.2	100	100	3.2	B7	P
HP4115	542 310 000	A	4	2	200	100	4.3	3.2	100	100	3.2	B5	P
HP4115c	542 310 000	A	4	2	250	100	4.5	3.2	100	100	3.2	B5	P
HP4115c	041 231 500	A	4	2	250	100	4.5	3.2	100	100	3.2	B5	P
HR2	112 311 100	D <sub>1</sub>	4				5		D			B7G	R
HR2	642 300 000		2	2	150		1.2	0.6	125		0.6	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

RR	892 300 000		4				60		Rec	20mA	B4	IW3
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
HR2S	023 004 060		2	2	150		1-2	0-6	125		0-6	8SC	T
HR3	112 311 100	D <sub>1</sub>	4				15		REC		10mA	B7G	R
HR6	112 311 100	D <sub>1</sub>	4				60		REC		20mA	B7G	R
HR7	020 000 030	D <sub>1</sub>	4				30		REC		15mA	A08	R
HR210	642 300 000		2	1-5	200		1	1-3	150		1-3	B4	T
HR406	642 300 000		4	3	200		1	1-5	150		1-5	B4	T
HR410	642 300 000		4	3	200		1	1-5	150		1-5	B4	T
HSD	809 231 600	G <sub>1</sub>	13	3	200		4-6	2-3	150		2-3	B7	DDT
HVRI	002 300 000	D <sub>1</sub>	2				5		D			B4	R
HVR2	003 200 000	D <sub>1</sub>	4				3		D			B4	R
HVR2A	003 200 000	D <sub>1</sub>	2				3		D			B4	R
HVUI	002 300 000	D <sub>1</sub>	4				3		D			B4	R
HY24	264 300 000		2	45	175		20		100			UX4	T
HY65	030 540 210	A <sub>1</sub>	6	45	350	200	63		100	100		A08	P
HY113	264 030 000		1-4	4-5	50		0-4	0-25	No Data Available			UX5	T
HY115	364 520 000		1-4	1-5	50	20	0-03	0-06	No Data Available			UX5	P
HY125	364 520 000		1-4	3	50	50	0-9		No Data Available			UX5	P
HY615	020 000 310	A <sub>1</sub> G <sub>1</sub>	6	35	300		20		100			A08	T
HY866	280 300 000		2-5				120		REC		30mA	UX4	R
HZ50	280 300 000		13				60		REC		20mA	UX4	R
H2	642 300 000		2	1	150		2-5	0-8	150		0-8	B4	T
H4D	809 231 600	G <sub>1</sub>	2	2-5	200		5-5	2-7	150		2-7	B7	DDT
H12	642 300 000		2	1-5	100		0-6	1-2	100		1-2	Sm4	T
H30	000 231 600	G <sub>1</sub>	13	1-5	250		7-5	6-0	200		6	B7	T
H42	000 231 600	G <sub>1</sub>	4	2	250		1	1-7	200		1-7	B7	T
H63	020 600 310	G <sub>1</sub>	6	2	250		1	1-5	200		1-5	A08	T
H141D	206 080 030	G <sub>1</sub>	1-4	1	90		0-1	0-25	80		0-25	M08	DT
H210	642 300 000		2	3	150		1-1	1-15	100		1-15	B4	T
H607	642 300 000		6	1	100			0-45	100		0-45	B4	T
IRV120/350s	023 180 090		4				60		REC		20mA	8SC	RR
IW2	893 200 000		4				30		REC		15mA	B4	RR
IW4/350	892 300 000		4				60		REC		20mA	B4	RR
IW4/500	893 200 000		4				60		REC		20mA	B4	RR
KBC1	023 098 060	G <sub>1</sub>	2	4-5	150		2-5	1-0	100		1	8SC	DDT
KBC32	036 980 200	G <sub>1</sub>	2	1	100		2-4	1-2	100		1-2	A08	DDT
KCF30	037 546 200	G <sub>1</sub>	2	0 2-5	100 125	80	5-3 1-5	1-7 0-9	100 100		1-7 0-9	A08	TP
KCHI	023 064 570	G <sub>1</sub>	2	— 5	75 150	60	3 1	1-7	80 100	75 60	1-7	8SC	TH
KCI	023 004 060		2	1-5	150		1-2	0-6	125		0-6	8SC	T
KC3	023 004 060		2	2-8	150		3	2-5	100		2-5	8SC	T
KC4	023 004 060		2	1-5	150		2-2	1-4	125		1-4	8SC	T
KC50	642 300 000		2	1	40		0-25	0-4	No Data Available			Sm4	T
KC5I	642 300 000		2	2	40		1-25	0-5	No Data Available			Sm4	T
KDDI	023 074 460		2	0	90		0-8		80			8SC	TT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

O	023 064 560	G <sub>1</sub>	2	I	90	50	2		80	60		8SC	KK2
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P	542 310 000	A	6	16	250	250	72	6	100	100	6	B5	KT8
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
KD50	642 300 000		2	2.8	40		1.8	0.56	No Data Available			Sm4	T
KE50	542 300 000	A	2	2	125	50	0.8	0.56	100	60	0.56	Sm4	P
KFI	050 412 300	A	2	1	125	150	3	1.8	125	150	1.8	C7	P
KF2	050 412 300	A	2	1	125	150	3	1.3	125	150	1.3	C7	P
KF3	023 010 560	G <sub>1</sub>	2	1	90	90	1	0.5	80	90	0.5	8SC	P
KF4	023 010 560	G <sub>1</sub>	2	1	90	90	1.2	0.7	80	90	0.7	8SC	P
KF7	023 004 500	A	2	1.5	90	90	1.8	0.7	80	90	0.7	8SC	P
KF8	023 004 500	A	2	1	90	90	1.5	0.6	80	90	0.6	8SC	P
KF35	026 510 300	G <sub>1</sub>	2	1.5	125	60	1.45	1.08	125	60	1.08	A08	P
KHI	023 051 560	G <sub>1</sub>	2	1.5	125	60		1.4	125	60	1.4	8SC	P
KK32	037 546 200	G <sub>1</sub>	2	0.5	90		1.3		80			A08	O
				100	50		0.7		100	60			
KLL3	423 564 570		2	12	150	150	8		100	100		8SC	PP
KLL32	026 447 350		2	11.3	125	150	3.8	2.6	100	100	2.6	A08	PP
KLI	642 350 000		2	4.5	90	90	8	1.7	80	75	1.7	B5	P
KLI	032 004 560		2	4.5	90	90	8	1.7	80	75	1.7	8SC	P
KL2	023 004 560		2	7.5	90	90	11	1.8	80	75	1.8	8SC	P
KL4	023 004 560		2	2.6	90	90	4.7	1.8	80	75	2.8	8SC	P
KL5	032 004 560		2	4	90	90	4.8	1.4	80	75	1.4	8SC	P
KL35	036 540 200		2	4.5	125	150	5.6	2.2	100	100	2.2	A08	P
KR5	264 530 000		6	9	150	150	14	1.9	100	100	1.9	UX5	P
KR20	264 413 000		2.5	0	250		3.5	1.4	250		1.4	UX6	T
KR22	264 413 000		6	0	250		3.5	1.4	250		1.4	UX6	T
KR28	289 130 000		6				30		REC		15mA	UX5	RR
KR25	265 413 000		2.5	16.5	250	250	34	2.2	100	PenLF	2.2	UX6	P
KR31	281 300 000		10				120		REC		30mA	UX4	R
KTW61	026 510 310	G <sub>1</sub>	6	3	250	100	10	2.9	100	90	2.9	A08	P
KTW62	026 500 310	G <sub>1</sub>	6		250	100	8	2.85	100	100	2.8	A08	P
KTW63	026 510 310	G <sub>1</sub>	6	3	250	100	7.6	1.5	100	90	1.5	A08	P
KTW73	026 510 310	G <sub>1</sub>	6	3	250	100	6.5	1.7	100	90	1.7	A08	P
KTW74	026 500 310	G <sub>1</sub>	13	3	250	100	6.5	1.7	100	90	1.7	A08	P
KTZ41	061 231 500	G <sub>1</sub>	4	1.5	250	250	18	12	200	200	10	B7	P
KTZ63	026 500 310	G <sub>1</sub>	6	2	250	100	1	1.23	100	100	1.2	A08	P
KTZ73	026 500 310	G <sub>1</sub>	6	3	250	100	2	1.5	100	90	1.5	A08	P
KT2	642 350 000		2	4.5	150	150	7.5	2.5	100	100	2.5	B5	P
KT8C	542 310 000	A	6.3		250	250	72	6	100	PenLF	6	B5	P
KT21	642 350 000		2	2.5	150	125	5.3	5.3	100	100	5.3	B5	P
KT24	642 350 000		2	2.8	150	150	10	3.2	100	125	3.2	B5	P
KT30	045 231 600		13	12	250	250	40	3.9	100	PenLF	3.9	B7	P
KT31	305 221 600	G <sub>1</sub>	13	4	200	175	40	10	100	150	9	B7	P
KT32	026 540 310		26	7.6	125	150	75	9	100	100	8	A08	P
KT33	026 540 310		26	13.2	200	200	60	10	100	100	9	A08	P
KT33c	326 540 210		13	7	175	175	92	10	100	100	9	A08	P
KT35	326 540 210		13	11.5	200	200	50	10	100	100	9	A08	P
KT36	020 540 310	A	26	10	150	150		11	100	100	10	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

DDT	682 390 000	G <sub>1</sub>	2	5.5	150		2.5	1.4	100		1.4	B5	K23A
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
KT41	045 231 600	A	4	4.4	250	250	40	10.5	100	PenLF	9	B7	P
KT42	045 231 600		4	16.5	250	250	34	2.5	100	PenLF	2.5	B7	P
KT44	041 231 500		4	15	250	250	85	6.25	100	PenLF	6.2	B7	P
KT45	041 231 500		4	15	250	250	85	6.3	100	PenLF	6.0	B7	P
KT61	026 540 310		6	4.4	250	250	40	10.5	100	PenLF	9	A08	P
KT63	026 540 310		6	16.5	250	250	34	2.5	100	PenLF	2.5	A08	P
KT66	026 540 310		6	15	250	250	85	6.3	100	PenLF	6.0	A08	P
KT71	026 540 310		48	9.8	175	175	70	10	100	100	9	A08	P
KT72	026 540 310		16	12.5	175	175	30	2.5	100	100	2.5	A08	P
KT73	026 540 310		6	12.5	175	175	35	2.5	100	100	2.5	A08	P
KT74	026 540 310		16	12.5	175	175	30	2.5	100	100	2.5	A08	P
KT76	026 540 310		15	13	175	175	35	2.5	100	100	2.5	A08	P
KT81	265 004 130		6	4.4	250	250	40	10.5	100	PenLF	9	B8B	P
KT101	265 004 130		80	9.5	175	175	70	10	100	100	9	B8B	P
K4	892 300 000		4				120		REC		30mA	B4	RR
K23B	682 390 000	G <sub>1</sub>	2	1.5	150		1.4	1.2	150		1.2	B5	DDT
K24	265 130 000	G <sub>1</sub>	2.5	1.5	175	75	2	0.8	100	75	0.8	UX5	P
K27	264 130 000		2.5	4.5	90		3	1	80		1	UX5	T
K30A	642 300 000		2	3	150		1.5	0.8	150		0.8	B4	T
K30C	642 300 000		2	1.5	150		2	1.4	100		1.4	B4	T
K30D	642 300 000		2	3	150		4	1.5	100		1.5	B4	T
K30E	642 300 000		2	4.5	150		2	1.5	100		1.5	B4	T
K30g	642 300 000		2	7	150		6	3.5	100		3.5	B4	T
K30K	642 300 000		2	1.5	150		2.2	1.4	100		1.4	B4	T
K33A	064 234 700		2	0	150		3		150			B7	TT
K33B	446 230 700		2	1.5	125		3	2.1	125		2.1	B7	TT
K40N	542 300 000	A	2	0	150	90	2.5	1.4	100	90	1.4	B4	P
K40N	041 230 500	A	2	0	150	90	2.5	1.4	100	90	1.4	B7	P
K50M	041 231 500	A	2	5	125	125	3	1.5	100	100	1.5	B7	P
K50N	064 235 500	G <sub>1</sub>	2	1.5	125	60	2	1.4	125	60	1.4	B7	P
K70B	642 350 000		2	4.5	150	150	9.5	2.5	100	100	2.5	B5	P
K70D	642 350 000		2	2.4	125	150	5	4	100	125	4	B5	P
K77A	465 230 574		2	10.5	125	150	2.5	4	100	100	4	B9	PP
K450/50	642 300 000		4	50	400		120	5	100		5	B4	T
LA	364 520 000		6	12	175	175	22	2.2	100	100	2.2	UX5	P
LD210	642 300 000		2	4.5	150		3	1.3	125		1.3	B4	T
LD410	642 300 000		4	6	200		4	1.8	100		1.8	B4	T
LG5	21B 090 130		6				120		REC		30mA	A08	RR
LG14	123 000 000	D <sub>1</sub>	6				5		D			B3G	R
LL2	642 300 000		2	2.5	150		3	2.6	125		2.6	B4	T
LL2s	023 004 060		2	2.5	150		3	2.6	125		2.6	8SC	T
LL4	642 310 000		4	10	350		18	3.5	125		3.5	B5	T
LP2	642 300 000		2	4.5	150		10	3.6	100		3.6	B4	T
LP4	642 300 000		4	36	250		48	5.5	100		5.5	B4	T
LP220	642 300 000		2	4.5	150		5	3.5	100		3.5	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

DDT	028 960 310	G <sub>1</sub>	6	5	200		11.5	3	100		3	A08	11HLD6
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P	642 310 000	S	4	11	250	200	32	3	100	100	3	B5	MKT4
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P	642 310 000	S	4	9	250	200	32	3	100	PenLF	3	B5	MPT4
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P	542 310 000	A	4	1.5	200	100	4.8	2.8	100	100	2.8	B5	MS/Pen
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
L2	642 300 000		2	3·8	150		4	1·5	125		1·5	B4	T
L2D	642 310 000		2	4·5	150		2	1·5	100		1·5	B5	T
L2/DD	682 390 000	G <sub>1</sub>	2	3·8	150		4	1·6	100		1·6	B5	DDT
L4	642 300 000		4	16	250		20	3·2	100		3·2	B4	T
LI2	642 300 000		2	3	40		2·2	0·8	No Data Available			Sm4	T
L21	642 300 000		2	6	150		2·2	1·8	100		1·8	B4	T
L21DD	682 390 000	G <sub>1</sub>	2	6	150		2·2	1·8	100		1·8	B5	DDT
L22DD	206 080 930	G <sub>1</sub>	2	42	150		4	1·55	100		1·55	A08	DDT
L30	040 231 600		13	8	200		25	4·2	100		4·2	B7	T
L63	026 040 310		6	8	250		9	2·6	100		2·6	A08	T
L77	6*2 364 100		6	8·5	250		10·5	2·2	100		2·2	B7G	T
L210	642 300 000		2	6	150		4·2	1·6	100		1·6	B4	T
L408	642 300 000		4	3	150		5	1·5	125		1·5	B4	T
L412	642 300 000		4	1·5	200		3	1·2	200		1·2	B4	T
L414	642 300 000		4	8	150		12	2·8	100		2·8	B4	T
L415	642 300 000		4	10	200		8	2	100		2	B4	T
L486D	642 350 000		4	15	250	250	35	2·7	100	PenLF	2·7	B5	P
ME2	642 350 000		2	12	200	200	13		100	100		B5	P
ME25	642 350 000		4	30	400	300	60		100	100		B5	P
MHD4	908 231 600	G <sub>1</sub>	4	4	250		4	2·2	150		2·2	B7	DDT
MHL4	642 310 000		4	8	250		8	2·5	100		2·5	B5	T
MH4	642 310 000		4	4	250		5	3·6	150		3·6	B5	T
MH40	642 310 000		4	1	100			2·4	100		2·4	B5	T
MH41	642 310 000		4	1·5	200		5·2	6	200		6	B5	T
MH206	645 230 600	G <sub>1</sub>	2	3	150	75	3·2		100	75		B7	H
MH1118	426 510 310	G <sub>1</sub>	10	3	200	100	3·5		100	90		A08	P
MH4105	645 231 700	G <sub>1</sub>	4	3	200	100	7·5		100	100		B7	H
MKT4	045 231 600		4	11	250	200	32	3	100	100	3	B7	P
ML4	642 310 000		4	16	250		14	4·2	100		4·2	B5	T
ML6	642 310 000		6	8	200		24	3·8	100		3·8	B5	T
MM4V	542 310 000	A	4	1·5	200	125	6	2·5	100	100	2·5	B5	P
MM20	542 310 000	A	20	0	200	100	6	3·5	100	100	3·5	B5	P
MO465	645 231 700	G <sub>1</sub>	4	— 1·5	75 250	75	2 1·6		80 100	75		B7	O
MO495	123 174 560	G <sub>1</sub>	4	1·5 8·5	90 250	75	2 1·6		80 100	75		8SC	O
MP Pen	045 231 600		4	16	250	250	30	3·5	100	PenLF	3·5	B7	P
MPT4	045 231 600		4	9	250	200	32	3	100	PenLF	3	B7	P
MP2	642 300 000		2	12	150		12·5	3	100		3	B4	T
MP4	067 231 500	G <sub>1</sub>	4		250	150	8	2·5	100	100	2·5	B7	PP
MR1	802 300 000		4				120		REC		30mA	B4	R
MR4	642 300 000		4	3	200		6	2·5	150		2·5	B4	T
MSG/HA	542 310 000	A	4	1·5	200	80	2·1	2	100	75	2	B5	P
MSG/LA	542 310 000	A	4	1·5	200	75	5·2	3·75	100	75	3·75	B5	P
MS/Pen	041 231 500	A	4	1·5	200	100	4·8	2·8	100	100	2·8	B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE	
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V			
P	04I 23I 500	A	4	2.5	200	150	9	4	100	150	4	B7	MS/PenA	
P	04I 23I 500	A	4	1.5	200	100	4.8	2.8	100	100	2.8	B7	MS/PenT	
P	542 310 000	A	4	1.5	200	100	4.8	2.8	100	100	2.8	B5	MS/PenT	
T	642 300 000		6	12	350		45	4.2	100		4	B4	MZ05-20	
P	364 526 300			1.4	4.5	90	90	9.5	2.1	80	75	2	B7G	N18
P	365 *24 300			1.4	4.5	90	90	9.5	2.1	80	75	2	B7G	N19
P	412 36* 500		13	8	175	150	50	10	100	100	9	B7G	N37	
P	026 540 310		6	6	250	250	36	9	100	PenLF	8	A08	N147	
P	261 054 130		6	7	250	250	36	10	100	100	9	B8A	N150	
P	261 054 130		6	13.5	250	250	22.5	2.9	100	100	2.9	B8A	N151	
P	045 23I 600		4	12.5	250	250		9.1	100	100	8	B7	OP41	
P	045 23I 600		4	6.2	250	250		10.5	100	150	9	B7	OP42	

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
MS/PenA	542 310 000	A	4	2.5	200	150	9	4	100	125	4	B5	P
MS/PenB	061 231 500	G <sub>1</sub>	4	1.5	200	100	4.8	2.8	100	100	2.8	B7	P
MSP4	041 231 500	A	4	1.5	200	75	2.4	1.1	100	75	1.1	B7	P
MSP4	542 310 000	A	4	1.5	200	75	2.4	1.1	100	75	1.1	B5	P
MSP41	542 310 000	A	4	4	250	250	8.5	3.2	100	PenLF	3.2	B5	P
MSP41	041 231 500	A	4	4	250	250	8.5	3.2	100	PenLF	3.2	B7	P
MS4	542 310 000	A	4	1	250	75		1.1	250	75	1.1	B5	P
MS4B	542 310 000	A	4	1	200	75	3.4	3.2	200	75	3.2	B5	P
MUI	002 300 000	D <sub>1</sub>	4				60		REC		20mA	B4	R
MU2	002 300 000	D <sub>1</sub>	2				5		D			B4	R
MUI2	892 300 000		4				60		REC		20mA	B4	RR
MUI2/14	892 300 000		4				60		REC		20mA	B4	RR
MUI4	892 300 000		4				60		REC		20mA	B4	RR
MU4250	232 300 000	D <sub>1</sub>	4				120		REC		30mA	B4	R
MVSG	542 310 000	A	4	1.5	200	75	7.5	2.5	100	75	2.5	B5	P
MVSPen	041 231 500	A	4	1.5	200	100	4.3	2.2	100	100	2.2	B7	P
MVSPenB	061 231 500	G <sub>1</sub>	4	1.5	200	100	4.3	2.2	200	100	2.2	B7	P
MX40	645 231 700	G <sub>1</sub>	4	3	150 250	75			100	75	2.8	B7	H
NF2	023 110 560	G <sub>1</sub>	12.5	2	200	250	3	2.1	100	150	2.1	8SC	P
NF3	023 110 560	G <sub>1</sub>	12.5	2	200	100	4.5	2.3	100	100	2.3	8SC	P
NG320	002 300 000	D <sub>1</sub>	2						D			B5	D
NI4	036 540 200		1.4	7	90	90	7	1.55	80	75	1.55	A08	P
NI5	026 540 230		1.4	7	90	90	7	1.55	80	75	1.55	A08	P
NI6	026 540 230		1.4	4.5	90	90	9.5	2.1	80	90	2.1	A08	P
NI7	264 536 200		1.4	7	90	75	7.4	1.58	80	60	1.58	B7G	P
N30	045 231 600		13	12	250	250	40	3.9	100	PenLF	3.9	B7	P
N31	205 331 600	G <sub>1</sub>	13	4	200	175	40	10	100	125	9	B7	P
N41	045 231 600		4	4.4	250	250	40	10.5	100	PenLF	9	B7	P
N42	045 231 600		4	16.5	250	250	34	2.5	100	PenLF	2.5	B7	P
N43	005 231 600	G <sub>1</sub>	4	4.4	250	250	40	10	100	PenLF	9	B7	P
N77	412 360 500		6	12	250	250	20	2.6	100	PenLF	2.6	B7G	P
N78	412 36* 500		6	5.5	250	250	35	10	100	150	9	B7G	P
NI08	412 36* 500		40	8	175	150	50	10	100	100	9	B7G	P
NI42	412 36* 500		45	9.5	175	175	54.5	9.5	100	100	9	B7G	P
NI44	412 360 500		6	12.5	250	250	16	2.6	100	PenLF	2.6	B7G	P
NI45	261 *54 130		40	6.3	175	150	29	7.5	100	100	7	B8A	P
OBC3	041 896 230		12.5	2	250		1	1.1	150		1.1	A08	DDT
OM1	020 080 310		30				120		REC		30mA	A08	R
OM3	028 190 310		6						D			A08	DD
OM4	026 980 310	G <sub>1</sub>	6	5	250		5.5	2.2	100		2.2	A08	DDT
OM5	026 510 310	G <sub>1</sub>	6	2	250	100	3	1.8	100	100	1.8	A08	P
OM6	026 510 310	G <sub>1</sub>	6	2.5	250	100	6	2	100	100	2	A08	P
OM10	027 546 310	G <sub>1</sub>	6	2	75 250	100	3 2.7		80 100	100		A08	TH

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

RR	892 300 000		4				30		Rec		15mA	B4	PB495
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P	005 231 600	G <sub>1</sub>	4	5	250	250	40	9·1	100	100	8	B7	PenA4
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
015/400	642 300 000		4	35	400		40	4.5	100		4.5	B4	T
PABI	023 110 980		6						D			8SC	DDD
PAI	642 310 000		4	10	200		40	5	100		5	B5	T
PA20	642 300 000		2	36	300		49	5.2	100		5	B4	T
PA40	642 300 000		4	90	400		200	10	100		9	B4	T
PBF2	026 895 310	G <sub>1</sub>	6	3	250	100	5.8	1.2	100	100	1.2	A08	DDP
PD220	446 230 700		2	1.15	150		29		150			B7	TT
PD220A	446 230 700		2	6	150		32	1.5	100		1.5	B7	TT
PenAI	642 350 000		4	16.5	250	250	32	3	100	PenLF	3	B5	P
PenA4	045 231 600		4	5.8	250	250	36	9.5	100	PenLF	9	B7	P
PenB1	642 350 000		2	4.5	150	150	8		100	100		B5	P
PenB4	045 231 600		4	14	250	275	72	8.5	100	PenLF	7	B7	P
PenDD1360	968 231 500	G <sub>1</sub>	13	5.3	250	250	32	8.2	100	PenLF	7	B7	DDP
PenDD4020	968 231 500	G <sub>1</sub>	40	7.75	250	250	43	7.8	100	PenLF	6	B7	DDP
PenDD4021	968 231 500	G <sub>1</sub>	45	10	175	175	64	10.5	100	PenLF	8	B7	DDP
Pen4DD	918 236 500	G <sub>1</sub>	4	6	250	250	36	9.5	100	PenLF	8	B7	DDP
Pen4VA	642 310 000	S	4	22	250	250	36	2.8	100	PenLF	2.8	B5	P
Pen4VA	045 231 600		4	22	250	250	36	2.8	100	PenLF	2.8	B7	P
Pen4VB	045 231 600		4	5.8	250	250	36	9.5	100	PenLF	8	B7	P
Pen13	023 100 560	G <sub>1</sub>	13	14	200	200	25	2.5	100	100	2.5	8SC	P
Pen13A	023 110 560	G <sub>1</sub>	33	8.5	200	200	45	8	100	100	6	8SC	P
Pen13C	045 231 600		13	11	250	250	32	6.5	100	PenLF	6	B7	P
Pen24	206 540 030		2	3.3	125	125	5	4	100	100	4	M08	P
Pen25	206 540 030		2	3.6	125	125	5	3	100	100	3	M08	P
Pen26	023 100 560	G <sub>1</sub>	24	19	200	100	40	3.1	100	60	3	8SC	P
Pen36C	045 231 600		33	8.5	200	200	45	8	100	100	7	B7	P
Pen40DD	918 236 500	G <sub>1</sub>	44	8.5	200	200	45	8	100	100	7	B7	DDP
Pen44	216 540 030		4	11	300	275	70	10.6	100	PenLF	9	M08	P
Pen45	216 540 030		4	8.5	250	250	40	8.8	100	PenLF	8	M08	P
Pen45DD	216 590 830	G <sub>1</sub>	4	8.5	250	250	40	8.8	100	PenLF	8	M08	DDP
Pen46	210 540 030	A	4	8.5	300	225	63	8.5	100	PenLF	8	M08	P
Pen141	206 540 030		1.4	9	90	90	5.5	1.4	90	75	1.4	M08	P
Pen220	642 350 000		2	4.9	150	150	9	2.2	100	125	2.2	B5	P
Pen220A	642 350 000		2	9	150	150	18	2.2	100	100	2.2	B5	P
Pen231	642 350 000		2	2.5	125	125	5	3.6	100	100	3.6	B5	P
Pen383	216 540 030		38	10	175	175	64	10.5	100	100	9	M08	P
Pen384	216 540 030		38	7	125	125	40	7.8	100	100	7	M08	P
Pen425	642 350 000		4	25	300	200	20	1.7	100	100	1.7	B5	P
Pen428	045 231 600		4		250	250	72		100	PenLF		B7	P
Pen453DD	216 590 830	G <sub>1</sub>	45	10	175	175	64	10.5	100	100	9	M08	DDP
Pen1340	045 231 600		13	8.6	250	250	41	6.4	100	PenLF	6	B7	P
Pen2020	023 100 560	G <sub>1</sub>	20	19	200	100	40	3.1	100	60	3.1	8SC	P
Pen3520	045 231 600		35	8	200	200	40	7.3	100	100	7	B7	P
Pen3820	045 231 600		38	10	150	175	64	10.5	100	100	9	B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	*4I 23* *5I	A	21.5	2I	175	175	45	6.5	No Data Available			B9A	PL8I
P	*4I 23* 6*5		16	14.2	200	200	45	8.2	100	100	7	B9A	PL82
P	54I 23I 600		15	2.9	175	175	36	10	100	100	9	B9A	PL83

P	642 310 000	S	4	11	150	150	20	1.75	100	100	1.7	B5	PM24
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
PF9	026 510 310		6	3.5	250	100	7.5	1.65	100	100	1.6	A08	P
PF462	041 230 500	A	2	1	150	150	3	1.85	150	150	1.85	B7	P
PF472	041 230 500	A	2	0.5	150	150	2.5	1.7	150	150	1.7	B7	P
PL33	026 540 310		19	6	250	250	36	9.0	100	PenLF	8	A08	P
PL38	120 540 310	A	30	7	250	250	100	14.3	100	PenLF	10	A08	P
PM1A	642 300 000		2	0	100		1	1.2	100		1.2	B4	T
PM1HF	642 300 000		2	3	150		1.5	0.8	100		0.8	B4	T
PM1HL	642 300 000		2	1.5	150		2.3	1.2	150		1.2	B4	T
PM1LF	642 300 000		2	6	125		3	0.9	100		0.9	B4	T
PM2	642 300 000		2	7	100		4	0.9	100		0.9	B4	T
PM2A	642 300 000		2	6	150		5	2	100		2	B4	T
PM2B	446 230 700		2	1	125		20	2.5	100		2.5	B7	TT
PM2BA	446 230 700		2	1	100			2.1	100		2.1	B7	TT
PM2DL	642 300 000		2	4.5	150		2	1.5	100		1.5	B4	T
PM2DX	642 300 000		2	4.5	150		2	1	100		1	B4	T
PM2HL	642 300 000		2	1.5	150		2.2	1.4	150		1.4	B4	T
PM3	642 300 000		4	0	100		2	1.05	100		1.0	B4	T
PM4DX	642 300 000		4	0	100		1.5	2	100		2	B4	T
PM12	542 300 000	A	2		150	75	4.25	1.1	100	75	1.1	B4	P
PM12A	542 300 000	A	2	1	150	75	2	1.5	100	75	1.5	B4	P
PM12M	542 300 000	A	2	1	150	90	2.5	1.4	150	90	1.4	B4	P
PM12V	542 300 000	A	2	0	150	90		0.75	100	90	0.7	B4	P
PM14	542 300 000	A	4	0	150	75	2.75	0.87	100	75	0.8	B4	P
PM22	642 350 000		2	10	150	150	15	1.3	100	100	1.3	B5	P
PM22A	642 350 000		2	4.5	150	150	5.6	2.2	100	125	2.2	B5	P
PM22C	642 350 000		2	16	150	150	23	3	100	100	3	B5	P
PM22D	642 350 000		2	3	150	150	5	3	100	125	3	B5	P
PM24	642 350 000		4	11	150	150	20	1.75	100	100	1.7	B5	P
PM24A	642 350 000		4	35	400	200	50	4	100	100	4	B5	P
PM24B	642 350 000		4	40	400	300	30	2.1	100	100	2.1	B5	P
PM24C	642 350 000		4	28	400	200	30		100	100		B5	P
PM24D	642 350 000		4	35	400	200	50	4	100	100	4	B5	P
PM24M	642 350 000		4	17	250	250	30	3	100	PenLF	3	B5	P
PM202	642 300 000		2	12	150		14	2.5	100		2.5	B4	P
PM252	642 300 000		2	15	125		10		100			B4	T
PM254	642 300 000		4	21	200		15		100			B4	T
PM256	642 300 000		6	27	250		20		100			B4	T
PN2	642 350 000		2	7.5	150	150	6		100	100		B5	P
PP2	642 300 000	S	2	5	150	150	7	2.1	100	100	2.1	B4	P
PP2	642 350 000		2	5	150	150	7	2.1	100	100	2.1	B5	P
PP2s	023 004 560		2	5	150	150	7	2.1	100	100	2.1	8SC	P
PP3/250	642 300 000		4	37	300		48	5.2	100		5.2	B4	P
PP4	642 350 000		4	15	250	250	36		100	PenLF		B5	P
PP4s	032 004 560		4	15	250	250	36		100	PenLF		8SC	P
PP4s	642 350 000		4	15	250	250	36		100	PenLF		B5	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
PP5/400	642 300 000		4	32	400		62	8	100		7	B4	T
PP6As	023 104 560		6	18	250	250	32	2.85	100	PenLF	2.8	8SC	P
PP6B	265 413 000		6		250	250	36	10	100	PenLF	9	UX6	P
PP6BG	026 540 310		6	6	250	250	36	10	100	PenLF	9	A08	P
PP6C	026 540 310		6	12	250	200	36	10	100	PenLF	9	A08	P
PP6E	045 231 600		6	17	400	275	72	8.5	100	PenLF	8	B7	P
PP13A	045 231 600		13	12	200	200	40	2.65	100	100	2.5	B7	P
PP13s	023 100 560	G <sub>1</sub>	13	14	200	200	25	3.5	100	100	3.5	8SC	P
PP24	005 231 600	G <sub>1</sub>	24	19	200	100	40	3	100	75	3	B7	P
PP24S	023 100 560	G <sub>1</sub>	24	19	200	100	40	3	100	75	3	8SC	P
PP34	005 231 600	G <sub>1</sub>	35	6.5	200	200	45	8.5	100	100	8	B7	P
PP34S	023 100 560	G <sub>1</sub>	35	6.5	200	200	45	8.5	100	100	8	8SC	P
PP35	045 231 600		35	6.5	200	200	45	8.5	100	100	8	B7	P
PP36	145 231 600		35	6.5	200	200	45	8.5	100	100	8	B7	P
PP37	005 231 600	G <sub>1</sub>	35	9.5	200	100	45	8.5	100	75	8	B7	P
PP215	642 300 000		4	4.5	90	90	8		80	75		B5	P
PP215S	032 004 560		2	4.5	90	90	8		80	75		8SC	P
PP220	642 300 000		2	12	150		12.5	3	100		3	B4	T
PP222	642 350 000		2	6	150	150	9		100	100		B5	P
PP222	642 300 000	S	2	6	150	150	9		100	100		B4	P
PP225	642 350 000		2	12	150	150	18	2	100	100	2	B5	P
PP225s	023 004 560		2	12	150	125	18	2	100	100	2	8SC	P
PP415	642 350 000		4	12	200	200	12	1.8	100	150	1.8	B5	P
PP416	642 350 000		4	12	200	75	10	2	100	60	2	B5	P
PP430	642 350 000		4	25	200	200	20	2	100	100	2	B5	P
PP2018	642 310 000	S	20	18	200	200	20	2.5	100	100	2.5	B5	P
PP2018	045 231 600		20	18	200	200	20	2.5	100	100	2.5	B7	P
PP2101	364 520 000		2	3	150	150	7	2.1	100	125	2.1	UX5	P
PP3521	040 231 600		35	25	200		70	6.3	100	6	6	B7	T
PP4100	642 350 000		4	40	400	300	30	3	100	PenLF	3	B5	P
PP4101	642 350 000		4	14	250	250	36	3.5	100	PenLF	3.5	B5	P
PP4118	160 452 300		40	10	175	175	35	6.5	100	100	6	C7	P
PTAD	968 231 500	G <sub>1</sub>		6	250	250	32	7	100	PenLF	7	B7	DDP
PTA	045 231 600		13	10	250	250	32	4	100	PenLF	4	B7	P
PTS	005 231 600	G <sub>1</sub>	26	5.5	250	200	40	6	100	PenLF	6	B7	P
PTSA	869 231 500	G <sub>1</sub>	26	5.5	200	200	40		100	PenLF		B7	DDP
PTSD	968 231 500	G <sub>1</sub>	26	5	250	200	40	6	100	PenLF	6	B7	DDP
PTZ	005 231 600	G <sub>1</sub>	40	5.5	250	200	40	7.5	100	PenLF	7	B7	P
PT2	642 350 000		2	4.5	125	125	5.3	2.6	100	100	2.6	B5	P
PT2A	642 350 000		2	10.5	150	150	18		100	100		B5	P
PT4	045 231 600		4	6	250	250	32.5	7.5	100	PenLF	7	B7	P
PT4	642 350 000		4		250	250		2.85	100	PenLF	2.85	B5	P
PT4/D	968 231 500	G <sub>1</sub>	4	6	250	250	32.5	7.5	100	PenLF	7	B7	DDP
PT10	045 231 600		4	7.5	250	250	40	9	100	PenLF	8	B7	P
PT12	204 531 102	A	10	15	250	250	62	6	100	PenLF	6	B9	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	542 310 000	A	6		300	300	30	2.8	No Data Available			B5	PT15
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P	400 235 100	A	6	40	200	300	40	4	100	100	4	B7	PV06-20
P	401 235 100	A	6	40	200	300	40	4	100	100	4	B7	PV06-25
P	401 235 100	A	12	25	250	200	40	2	100	100	2	B7	PV1-35

R	**I 23* *08		19				120		Rec		35mA	B9A	PY80
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P	401 235 000	A	4	25	300	125	25	1.4	100	100	1.4	B7	PZ03-3
P	401 235 000	A	4		400	150	40	1.25	100	100	1.2	B7	PZ05-15

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
PT16	642 350 000		4	15	300	300	55	4.8	100	PenLF	4.8	B5	P
PT25	642 350 000		4	22	400	200	62	4	100	100	4	B5	P
PT25H	642 350 000		4		400	300	62.5	6.5	100	PenLF	5	B5	P
PT41	642 350 000		4	12.5	250	200	30	3	100	100	3	B5	P
PT41B	642 350 000		4	40	400	300	30	2.25	100	PenLF	2	B5	P
PT225	642 350 000		2	6	150	150	8		100	100		B5	P
PT225	642 300 000	S	2	6	150	150	8		100	100		B4	P
PT240	642 350 000		2	10.5	200	150	16		100	100		B5	P
PT250	642 350 000		2	15	250	250	40		100	PenLF		B5	P
PT425	642 350 000		4		150	150	15	2	100	100	2	B5	P
PVB6	892 310 000		6				60		REC		20mA	B5	RR
PV25	091 231 800		25				60		REC		20mA	B7	RR
PV29	091 231 800		30				60		REC		20mA	B7	RR
PV29s	123 180 090		30				60		REC		20mA	8SC	RR
PV30	091 231 800		30				30		REC		15mA	B7	RR
PV30s	123 180 090		30				30		REC		15mA	8SC	RR
PV3018	190 812 300		30				60		REC		20mA	C7	RR
PX2	642 300 000		2	22	150		22	1.5	100		1.5	B4	T
PX4	642 300 000		4	43	300		43	6	100		6	B4	T
PX5	642 300 000		4	34	400		62.5	6.5	100		6.5	B4	T
PX25	642 300 000		4	50	400		50	7.5	100		7	B4	T
PX25A	642 300 000		4	1	100			6.9	100		6.9	B4	T
PX41	642 300 000		4	40	250		49	6	100		6	B4	T
PX230	642 300 000		2	15	150		17.5	3.5	100		3.5	B4	T
PX230SW	602 300 000	G <sub>1</sub>	2	15	150		18	3.5	100		3.5	B4	T
PX240	642 300 000		2	32	200		25	3	100		3	B4	T
PX2100	642 300 000		7.5	30	400		18	1.6	100		1.6	Sm4	T
PY31	020 080 310		17				120		REC		30mA	A08	R
PZ	264 530 000		2.5	16.5	250	250	31	2.5	100	PenLF	2.5	UX5	P
PZH	265 413 000		2.5	16.5	250	250	34	2.2	100	PenLF	2.2	UX6	P
PZ30	029 183 210		26				120		REC		30mA	A08	RR
P2	642 300 000		2	10	150		19	3.5	100		3.5	B4	T
P4	642 300 000		4	21	250		30	2.8	100		2.8	B4	T
P12/250	642 300 000		4	44	250		60	6	100		6	B4	T
P15/250(S)	642 300 000		4	44	250		60	6	100		6	B4	T
P15/250(S)	023 004 060		4	44	250		60	6	100		6	8SC	T
P24/450	642 300 000		7.5	70	400		55	2.1	100		2.1	B4	T
P25/500	642 300 000		6	90	400		65	3	100		3	B4	T
P26/500	642 300 000		4	100	400		62.5	4.2	100		4.2	B4	T
P27/500	642 300 000		4	27	400		62.5	8.5	100		8	B4	T
P30/500	642 300 000		4	100	400		60	4	100		4	B4	T
P41	216 040 030		4	11.8	250		16	4.5	100		4.5	M08	T
P61	216 040 030		6	11.8	250		16	4.5	100		4.5	M08	T
P215	642 300 000		2	12	150		8	2.2	100		2.2	B4	T
P220	642 300 000		2	7.5	150		6	3.0	100		3	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		

PP	24I 53I 420	A <sub>1</sub> A <sub>2</sub>	6	22	400	200	25	4	100	100	4	A08	QQV04-20
PP	273 624 540		3	10	300	200	20	2	100	100	2	B8B	QQZ04-15
P	265 51I 413		6	30	300	250	25	1.9	100	100	1.9	B9G	QV04-7
PP	24I 53I 420	A <sub>1</sub> A <sub>2</sub>	6	22	400	200	25	4	100	100	4	A08	QV04-20



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P220A	642 300 000		2	14	150		15	2.7	100		2.7	B4	T
P222	642 300 000		2	7.5	150		6	3	100		3	B4	T
P240	642 300 000		2	1	100			3.7	100		3.7	B4	T
P240A	642 300 000		2	21	150		25	5	100		5	B4	T
P410	642 300 000		4	12	150		8	1.5	100		1.5	B4	T
P414	642 300 000		4	16	100		14	2.8	80		2.8	B4	T
P415	642 300 000		4	25	150		14	1.5	100		1.5	B4	T
P420	642 300 000		4	85	400		50	6	100		6	B4	T
P430	264 300 000		4	30	200		25	2.2	100		2.2	UX4	T
P455	264 300 000		4	15	250		30	5.5	100		5.5	UX4	T
P460	642 300 000		4	40	200		50	3.5	100		3.5	B4	T
P469	045 231 600		4	14	250	275	72	8.5	100	PenLF	7	B7	P
P495	045 231 600		4	6	200	200	32		100	100		B7	P
P496	045 231 600		4	6	200	200	32	9.5	100	100	8	B7	P
P625B	642 300 000		6	1	200			2.8	200		2.8	B4	T
P650	642 300 000		9	1	200			3.5	200		3.5	B4	T
P861	289 130 000		6				30		REC		15mA	UX5	RR
P2018	642 310 000		20	15	200		20	4	100		4	B5	T
P2060	023 104 560		24	19	200	100	40	3.15	100	90	3	8SC	P
P2460	642 310 000	S	24	19	200	100	40		100	90		B5	P
P3580	045 231 600		33	8.5	200	200	45	8	100	150	7	B7	P
P4100	642 300 000		4	40	400		30		100			B4	T
QP21	446 235 700		2	9.8	150	150	3.5	2.3	100	100	2.3	B7	PP
QP22A	465 230 574		2	12	150	150	3	4	150	150	4	B9	PP
QP22B	446 235 700		2	11.7	150	150	3.8		100	100		B7	PP
QPT2	446 235 700		2	9	150	150	3.3		100	100		B7	PP
QP25	207 544 630		2	6	125	125	10	3	100	100	3	M08	PP
QP230	446 235 700		2	9.6	125	125	15	3	100	100	3	B7	PP
QP240	465 230 574		2	18	150	150	14	4	100	100	4	B9	PP
RA	892 310 000		13				30		REC			B5	RR
RA1	364 200 000		15	4.5	90		4.5	1.185	80		1.1	UX4	T
RB350/80	892 300 000		4				30		REC		15mA	B4	RR
RB500/120	892 300 000		4				60		REC		20mA	B4	RR
RB650/250	892 300 000		4				120		REC		30mA	B4	RR
RFP8/14	041 231 500	A <sub>1</sub>	4	20	400	250	35	4	100	PenLF	4	B7	P
RFP8/14	542 310 000	A <sub>1</sub>	4	20	400	250	35	4	100	PenLF	4	B5	P
RGN 1074	892 300 000		4				60		REC		20mA	B4	RR
RG250/1000	002 300 000	D <sub>1</sub>	4				120		REC		30mA	B4	R
RG250/3000	280 300 000		2.5				120		REC		30mA	UX4	R
RK10	264 300 000		7.5	100	350		50		100			UX4	T
RK15	264 300 000		2.5	33	250		22	2.35	100		2.3	UX4	T
RK16	264 130 000		2.5	28	250		26	2.6	100		2.6	UX5	T
RK19	200 300 000	D <sub>1</sub> D <sub>2</sub>	7.5				120		REC		30mA	UX4	RR
RK21	200 300 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
RK24	364 200 000		2	13.5	175		8	1.6	100		1.6	UX4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
T	241 600 003		6	2.5	250		10	6.5	100		5	B9G	RL16
T	244 664 413		6	1.5	250		10	9	100		7	B9G	RL37

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
RK60	200 300 000	D <sub>1</sub> D <sub>2</sub>	5				120		REC		30mA	UX4	RR
RS	802 310 000		3				60		REC		20mA	B5	R
RRAF	642 300 000		4	2	125		4	1.45	100		1.4	B4	T
RRBF	642 300 000		4	2.5	125		10	1.25	100		1.2	B4	T
RSAF	542 300 000	A	4	1	150	75	4.5	1.25	150	75	1.25	B4	P
RT1-2	642 300 000		4	2.6	125		26	2.5	100		2.5	B4	T
RT2	642 300 000		4	4	200		18	1.75	150		1.75	B4	T
RT3	642 300 000		4	2.3	300		15	2.85	100		2.8	B4	T
RV120/350	892 300 000		4				60		REC		20mA	B4	RR
RV120/350S	023 080 090		4				60		REC		20mA	8SC	RR
RV120/500	892 300 000		4				60		REC		20mA	B4	R
RV120/500S	023 080 090		4				60		REC		20mA	8SC	R
RV200/600	892 300 000		4				120		REC		30mA	B4	R
RX21	200 030 000	D <sub>1</sub>	2.5				120		REC		30mA	UX5	R
RX215	389 200 000		2.5				5		D			UX4	R
RZ	023 100 080		20				60		REC		20mA	8SC	R
R1	892 300 000		4				30		REC		15mA	B4	R
R2	892 300 000		4				60		REC		20mA	B4	R
R3	892 300 000		4				60		REC		20mA	B4	R
R4	892 300 000		4				60		REC		20mA	B4	R
R4a	892 300 000		4				60		REC		20mA	B4	RR
R10	112 311 100	D <sub>1</sub>	4				6		D			B7G	R
R11	002 300 000		4				60		REC		20mA	B4	R
R42	892 300 000		4				60		REC		20mA	B4	RR
R52	030 809 020		4				60		REC		20mA	A08	RR
R80	264 300 000		4	24	250		20	4	100		4	UX4	T
R236	026 510 300		1.4	2	100	100	1	0.55	100	100	0.5	A08	T
R2018	642 310 000		20	2.5	200		2.5	3	100		3	B5	T
SD	892 310 000		5						D			B5	D
SD6	*82 310 *00		6				5		D			B7G	R
SE211	542 300 000	A	2	1	150	75	1	1.5	150	75	1.5	B4	P
SE211C	542 300 000	A	2		150	75	1	1.5	150	75	1.5	B4	P
SE2118	542 310 000	A	20	24	200	100	3	3	100	60	3	B5	P
SGA1	542 310 000	A	4		200	100	6	3	100	100	3	B5	P
SG2	542 300 000	A	2		150	75	2.5	1	100	75	1	B4	P
SG215	542 300 000	A	2	1.5	150	75	2.7	1	100	75	1	B4	P
SG220	542 300 000	A	2	1.5	150	75	2.4	1.5	100	75	1.5	B4	P
SG220SW	652 300 000	G <sub>1</sub>	2	1.5	150	75	2.4	1.5	150	75	1.5	B4	P
S01	264 300 000		15	40.5	175		21	1.5	100		1.5	UX4	T
SPTS	041 231 500	A	13	1.5	250	100	2	3	100	100	3	B7	P
SPT2	041 230 500	A	2	1	125	125	2.8	1.5	125	125	1.5	B7	P
SPT4A	041 231 500	A	4	1.5	250	100	2	2.3	200	100	2.3	B7	P
SP2	041 230 500	A	2	1	150	150	3	1.8	150	150	1.8	B7	P
SP2B	061 230 500	G <sub>1</sub>	2	1	150	150	2.6	0.8	150	150	0.8	B7	P
SP2B(S)	032 004 560		2	1	150	150	2.6	0.8	150	150	0.8	8SC	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	04I 23I 500	A	4	2	200	100	3	2·3	100	100	2	B7	(MUL)SP4

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
(TUNG) SP4	SP2D 061 230 500	G <sub>1</sub>	2	1	150	150	1.4	1.7	150	150	1.7	B7	P
	SP2V 041 230 500	A	2	0	150	75	2.9	1.1	100	75	1	B7	P
	061 231 500	G <sub>1</sub>	4	2	200	100	3	2.3	100	100	2.3	B7	P
	SP4 542 310 000	A	4	2	200	100	3	2.3	100	100	2.3	B5	P
	SP4B 061 231 500	G <sub>1</sub>	4	2.4	250	250	4	3.4	100	PenLF	3.4	B7	P
SP4S 023 110 560	G <sub>1</sub>	4	2	250	100	3	3.5	100	100	3.5	8SC	P	
SP6 412 361 500			6	2	250	250	10	7.5	100	PenLF	7	B7G	P
SP6S 023 110 560	G <sub>1</sub>	6	2	250	100	3	2	100	100	2	8SC	P	
SP13 061 231 500	A	13	2	200	100	3.3	2.2	100	100	2.2	B7	P	
SP13 023 110 560	G <sub>1</sub>	13	2	200	100	3.3	2.2	100	100	2.2	8SC	P	
SP13B 061 231 500	G <sub>1</sub>	13	1.5	200	200	2	4	100	150	4	B7	P	
SP13C 061 231 500	G <sub>1</sub>	13	2.2	200	200	2.5	2.8	100	150	2.8	B7	P	
SP13S 023 110 560	G <sub>1</sub>	13	2	150	100	3	2.4	100	100	2.4	8SC	P	
SP20 542 310 000	A	20		200	100	4.5	3.5	100	100	3.5	B5	P	
SP22 206 510 030	G <sub>1</sub>	2	1	125	125	1.1	1.2	125	100	1.2	M08	P	
SP35 023 110 560	G <sub>1</sub>	35	8	200	200	41	7	100	PenLF	7	8SC	P	
SP41 216 510 030	G <sub>1</sub>	4	1.5	200	200	10.9	8.5	100	150	8	M08	P	
SP42 216 510 030	G <sub>1</sub>	4	1.3	200	125	20	8.4	100	100	8	M08	P	
SP61 216 510 030	G <sub>1</sub>	6	1.5	200	200	10.9	8.5	100	150	8	M08	P	
SP62 216 510 030	G <sub>1</sub>	6	1	200	100		9	200	100	8	M08	P	
SP65 023 110 560	G <sub>1</sub>	6	2	250	100	3	2.1	100	100	2.1	8SC	P	
SP141 206 500 030	G <sub>1</sub>	1.4	1	90	90	1.3	0.75	80	90	0.75	M08	P	
SP181 216 510 030	G <sub>1</sub>	18	1.5	200	200	10.9	8.5	100	PenLF	8	M08	P	
SP210 041 230 500	A	2	1	125	125	1.1	1.2	125	125	1.2	B7	P	
SP215 041 230 500	A	2	1.5	150	80	2.1	1.6	100	75	1.6	B7	P	
SP220 642 300 000			2	12	150		14	3	100		3	B4	T
SP1320 041 231 500	A	13	1.5	250	100	4.4	2.0	100	100	2	B7	P	
SP2220 041 231 500	A	22	3	250	200	4.9	2.65	100	150	2.6	B7	P	
SR2 642 300 000			2	16	200		10	3	100		3	B4	T
SR4 642 310 000			4	20	250		20	4	100		4	B5	T
SS210C 542 300 000	A	2	1	150	75		1.4	150	75	1.4	B5	T	
SS210DDT 682 390 000	G <sub>1</sub>	2	5.5	150		2.4	1.4	100		1.4	B5	T	
SS210D 642 300 000		2	4.5	150		2	1.6	100		1.6	B4	T	
SS210HF 642 300 000		2	4	150		1	0.75	100		0.75	B4	T	
SS210HL 642 300 000		2	1.5	150		2	1.4	125		1.4	B4	T	
SS210 542 300 000	A	2	1	150	75	0.6	1.4	150	75	1.4	B4	T	
SS220PA 642 300 000		2	6	150		8	3.5	100		3.5	B4	T	
SS220P 642 300 000		2	12	150		6	1.5	100		1.5	B4	T	
SS220SP 642 300 000		2	12	150		14	3.5	100		3.5	B4	T	
SS240SP 642 300 000		2	12	150		15	3.5	100		3.5	B4	T	
SS2018 542 310 000	A	20	3	200	100	3	3	100	90	3	B5	T	
SU25 *2* 0** 3*0	D <sub>1</sub>	2						D			A08	D	
SU45 112 311 100	D <sub>1</sub>	4				30		REC		15mA	B7G	R	
SU2130 002 300 000	D <sub>1</sub>	2				2		D			B4	R	
SU2150 002 300 000	D <sub>1</sub>	2				2		D			B4	R	

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	023 110 560	G <sub>L</sub>	13	3	200	100	8	1.85	100	100	1.85	8SC	SI323
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
SU2150A	002 300 000	D <sub>1</sub>	2				5		D			B4	R
SWG2	652 300 000	G <sub>1</sub>	2		150	75		1.5	100	75	1.5	B4	T
SW1	802 300 000		4				30		REC		15mA	B4	R
S02	264 300 000		7.4	88	400		55	2.1	100		2.1	UX4	T
S2	542 300 000	A	2	1	125	60	2.25	1.1	125	60	1.1	B4	P
S4V	542 310 000	A	4	1	200	75	1.5	1.15	100	75	1.1	B5	P
S4VA	542 310 000	A	4	1.5	200	100	2.75	2	100	100	2	B5	P
S4VB	542 310 000	A	4	1.5	200	125	4.6	2.5	100	100	2.5	B5	P
SI2	542 300 000	A	2	1	100	30	2.5	0.7	No Data Available			Sm4	P
S23	542 300 000	A	2	1	150	75	2.8	1.1	150	75	1.1	B4	P
S24	542 300 000	A	2	1	150	75	3.2	1.4	150	75	1.4	B4	P
S30C	642 300 000		4	38	300		50	5	100		5	B4	T
S30D	642 300 000		2	38	300		50	5	100		5	B4	T
S207	542 300 000	A	2	1.5	200	100	3	0.7	100	100	0.7	B4	P
S208	542 300 000	A	2	0	200	100	2	0.8	100	100	0.8	B4	P
S213	542 300 000	A	2	0.5	150	90	3	1.3	100	90	1.3	B4	P
S215	542 300 000	A	2	1.5	150	90	2.75	1.5	100	90	1.5	B4	P
S215A	542 300 000	A	2	1	150	60	2	1.1	150	60	1.1	B4	P
S215B	542 300 000	A	2	1	150	60	1.5	1.2	150	60	1.2	B4	P
S215VM	542 300 000	A	2	1.4	150	60	1.0	0.8	100	60	0.8	B4	P
S217	542 300 000	A	2	0.5	150	150	2.3	1.7	100	150	1.7	B4	P
S218	041 230 500	A	2	0.5	150	150	3	1.85	100	150	1.8	B7	P
S310A	265 113 000	G <sub>1</sub>	10	3	125	150	5.5	1.9	100	100	1.9	UX6	P
S311A	265 130 000	G <sub>1</sub>	10	15	125	150	30	2.8	100	100	2.8	UX5	P
S328A	265 113 000	G <sub>1</sub>	7.5	3	125	150	5.5	1.9	100	100	1.9	UX6	P
S329A	265 130 000	G <sub>1</sub>	7.5	15	125	150	30	2.8	100	100	2.8	UX5	P
S406/7	542 300 000	A	4	2	200	100	1.5	1	100	100	1	B4	P
S420	061 231 500	G <sub>1</sub>	4	3	250	250	11.5		100	200		B7	P
S430N	542 300 000	A	4		200	100	4	3	100	100	3	B5	P
S440	061 231 500	G <sub>1</sub>	4	2.35	250	250	4.1	3.45	100	200	3.4	B7	P
S493	542 310 000	A	4	2	200	100	4		100	100		B5	P
S495	542 310 000	A	4	2	200	100	6	2.5	100	100	2.5	B5	P
SI323	061 231 500	G <sub>1</sub>	13	3	200	100	8	1.85	100	100	1.85	B7	P
SI324	061 231 500	G <sub>1</sub>	13	2	200	100	3	2.37	100	100	2.3	B7	P
SI328	023 110 560	G <sub>1</sub>	13	2	200	100	3	2.37	100	100	2.3	8SC	P
S2018	041 231 500	A	20	3	200	60	4	1.2	100	60	1.2	B7	P
S2018	542 310 000	A	20	3	200	60	4	1.2	100	60	1.2	B5	P
S4045A	642 350 000		5	70	250	75	45	1.45	100	60	1.45	B5	P
TBC14	809 231 600	G <sub>1</sub>	4	7	250		4	2	100		2	B7	DDT
TBC113	809 231 600	G <sub>1</sub>	13	5	200		4	3.6	100		3.6	B7	DDT
TBI3	802 310 000		13						D			B5	D
TB032	642 300 000		2	30	150		12	1.5	100		1.5	B4	T
TB052	642 300 000		2	15	150		7	1.2	100		1.2	B4	T
TB062	642 300 000		2	10.5	150		13	2	100		2	B4	T
TBI02	642 300 000		2	4	150		5	1.25	100		1.2	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
TB122	642 300 000		2	4.5	150		6	3.5	100		3.5	B4	T
TB172	642 300 000		2	4.5	150		4	1.4	100		1.4	B4	T
TB282	642 300 000		2	1.5	150		2	1.3	125		1.3	B4	T
TB402	446 230 700		2	0	150		6		150			B7	TT
TB452	542 300 000	A	2	0	150	75	2	1.5	150	75	1.5	B4	P
TB552	542 300 000	A	2	0	150	75	4	1.5	150	75	1.5	B4	P
TB622	542 300 000	A	2		150	90	2	1.4	100	90	1.4	B4	P
TB9920	642 310 000		20	1.5	200		0.2	4	150		4	B5	T
TC432	642 300 000	S	2	4.5	150	150	9.5		100	100		B4	P
TC432	642 350 000		2	4.5	150	150	9.5		100	100		B5	P
TDD2	682 390 000	G <sub>1</sub>	2	5.5	150		2.5	1.4	100		1.4	B5	DDT
TDD2A	682 390 000	G <sub>1</sub>	2	1.5	150		1.95	1.2	125		1.2	B5	DDT
TDD4	908 231 600	G <sub>1</sub>	4	7	250		4	2	100		2	B7	DDT
TDD13C	809 231 600	G <sub>1</sub>	13	5	200		4	2	100		2	B7	DDT
TDD25	809 231 600	G <sub>1</sub>	25	1	100		4	2	100		2	B7	DDT
TD044	642 300 000		4	40	250		40	3	100		3	B4	T
TE094	642 310 000		4	16	200		12	1.3	100		1.3	B5	T
TE104	642 300 000		4	36	400		61	4	100		4	B4	T
TE244	642 310 000		4	3.5	200		6	2.4	150		2.4	B5	T
TE384	642 310 000		4	2	200		3	1.5	150		1.5	B5	T
TE424	542 310 000	A	4		200	100	3	2	100	100	2	B5	T
TE434	642 350 000		4	14	250	250	36		100	PenLF		B5	P
TE464	041 231 500	A	4		200	100	3	2.5	100	100	2.5	B7	P
TE474	041 231 500	A	4	1.5	200	100	4.5	2	100	100	2	B7	P
TE534	642 310 000	S	4	15	250	250	24		100	PenLF		B5	P
TE564	041 231 500	A	4	1.5	200	100	4.5	3.2	100	100	3.2	B7	P
TE634	045 231 600		4	22	250	250	36		100	100		B7	P
TE994	642 310 000		4	1.6	250		4	4	200		4	B5	T
TF64	061 231 500	G <sub>1</sub>	4	2.75	250	250	11	2	200	150	2	B7	P
TF104	642 300 000		4	36	400		61	4	100		4	B4	T
TH2	645 230 700	G <sub>1</sub>	2	{ 1.5 1.5	{ 150 250	75	{ 0.95 4	{ 1.2 1.2	{ 150 150	60	{ 1.2 1.2	B7	TH
TH4	645 231 700	G <sub>1</sub>	4	{ 2 —	{ 150 200	100	{ 6 3.5	{ 1.2 1.2	{ 150 200	75	{ 1.2 1.2	B7	TH
TH4A	645 231 700	G <sub>1</sub>	4	{ — 2	{ 125 250	100	{ 5 3.5	{ 6 5.5	{ 125 100	100	{ 6 5.5	B7	TH
TH4B	645 231 700	G <sub>1</sub>	4	{ 0 2.5	{ 100 250	100	{ 9.5 3.25	{ 5.5 1.2	{ 100 100	100	{ 5.5 1.2	B7	TH
TH13C	645 231 700	G <sub>1</sub>	13	{ — 1.5	{ 150 250	75	{ 6 4.0	{ 1.2 1.2	{ 150 100	75	{ 1.2 1.2	B7	TH
TH21C	645 231 700	G <sub>1</sub>	21	{ — 1.5	{ 125 250	75	{ 6 4	{ 6 6	{ 125 100	75	{ 6 6	B7	TH
TH22C	645 231 700	G <sub>1</sub>	29	{ — 2	{ 125 250	100	{ 5 3.5	{ 6 3.5	{ 125 100	100	{ 6 6	B7	TH
TH29	645 231 700	G <sub>1</sub>	29	{ — 2	{ 125 250	100	{ 5 3.5	{ 6 3.5	{ 125 100	100	{ 6 6	B7	TH

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

TH	217 640 530	G <sub>1</sub>	4	{ 0 3	100 250	100	3	5.3 3.1	100 100	100	5.3 3.1	M08	TH41
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P	204 051 103	A	6	13	250	250	72	6	100	100	6	B9G	TT14
PP	241 657 143		6	14	250	150	30	3.9	100	100	3.9	B9G	TT15
TT	442 310 000	A <sub>1</sub> A <sub>2</sub>	6	17	300		17	3.2	100		3	B5	TV03-10

DDP	023 189 560	G <sub>1</sub>	55	6	100	100	29	7.5	100	90	7	85C	UBL3
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
TH30C	645 231 700	G <sub>1</sub>	29	{ — 2.5	100 250	100	9.5 3.25	5.5	100 100	100	5.5	B7	TH
TH31	217 640 530	G <sub>1</sub>	4	{ 0 3	100 250	100	3	5.3 3	100 100	90	5.3 3	M08	TH
TH233	217 640 530	G <sub>1</sub>	23	{ 0 2	100 175	150	4 2.6	5.3 3	100 100	90	5.3 3	M08	TH
TH2320	645 231 700	G <sub>1</sub>	23	{ — 3	90 150	100	4.5 3		90 100	90		B7	TH
TH2321	645 231 700	G <sub>1</sub>	23	{ — 3	90 150	100	4.5 3		90 100	90		B7	TH
TL54	045 231 600		4	12.5	250	250	70		100	PenLF		B7	P
TP22	561 230 740	G <sub>1</sub>	2	{ 0 0	100 150	60	0.8 1.2	1.4 1.3	100 150	60	1.4 1.3	B9	TP
TP23	645 230 700	G <sub>1</sub>	2	{ 0 1.5	100 125	60	1	2.1 1.2	100 125	60	2.1 1.2	B7	TP
TP25	207 640 530	G <sub>1</sub>	2	{ 0 1.5	100 125	60	5.3 1	1.7 1.0	100 125	60	1.7 1	M08	TP
TP26	207 640 530	G <sub>1</sub>	2	{ 1 1	125 125	75	2.2 1.5	1.3 1.5	125 125	75	1.3 1.5	M08	TP
TP230	561 230 740	G <sub>1</sub>	2	{ — 0	100 150	75	2 4.3		100 150	75		B9	TP
TP443	642 350 000		4	22	250	250	36	5	100	PenLF	5	B5	P
TP1340	571 231 640	G <sub>1</sub>	13	{ — 5	200 200	200	2 6.5	1.4	150 100	100	1.4	B9	TP
TP2620	571 231 640	G <sub>1</sub>	26	{ 2.5 4	150 250	200	1.5 6.5	1.4 3.4	150 100	150	1.4 3.4	B9	TP
TSP4	061 231 500	G <sub>1</sub>	4	2.5	200	200	8	4.7	100	125	4.7	B7	P
TT4	642 310 000		4	16	250		20	3.2	100		3.2	B5	T
TT4A	642 310 000		4	9	250		20	4.1	100		4.1	B5	T
TT11	020 450 310	A	6	11	250	150	30	3.5	100	100	3.5	A08	P
TT12	204 531 102	A	10	13	250	250	72	6	100	100	6	B9G	P
TW1	802 310 000		20				60		REC		20mA	B5	R
TW2	892 310 000		30				60		REC		20mA	B5	RR
TX4	645 231 700	G <sub>1</sub>	4	{ — 1.5	150 300	90	4 5.5		150 200	90		B7	TH
TX21	645 231 700	G <sub>1</sub>	21	{ — 1.5	150 250	90	4 5.5		150 100	90		B7	TH
TI3U	023 100 060	G <sub>1</sub>	13	4	200		5.9	2.6	100		2.6	8SC	T
TI36	642 300 000		4	8	200			1.6	100		1.6	B4	T
UAF41	268 154 130		13	2.4	200	125	6	1.9	100	100	1.9	B8A	DP
UAF42	268 154 130		13	2.4	200	125	6	1.9	100	100	1.9	B8A	DP
UBC1	206 081 930	G <sub>1</sub>	13	1.7	200		3	2	150		2	A08	DDT
UBC41	264 098 130		14	1.6	175		1.5	1.65	150		1.65	B8A	DDT
UBF80	541 236 891		17	2	200	125	5	2.2	100	100	2.0	B9A	DDP
UBL1	206 581 930	G <sub>1</sub>	55	11.5	200	200	55	8.5	100	100	8	A08	DDP
UBL21	264 598 130		55	13	200	200	55	8	100	100	7	B8B	DDP
UB41	201 908 130		19				5		D			B8A	RR

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	023 110 560	G <sub>1</sub>	12.5	2.4	200	100	5.5	2.35	100	100	2.3	8SC	UF10
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RR	892 300 000		4				60		Rec	20mA	B4	UU10
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
UCH4	217 544 630	G <sub>1</sub>	20	{ 0 2	100 200	100	1.2 5.2	3.2 2.2	60 100		3.2 2.2	A08 B8B B8A	TH
UCH2I	276 454 131		20	{ 2 2	100 200		6.4 5.2	2.2 2.2	100 100	90	2.2 3.2		TH
UCH4I	276 454 130		14	{ 2 2	100 200		6.4 3.2	2.2	100 100		2.8		TH
UCH42	276 454 130		14	{ 2 0.5	100 200		6.4 3.2	2.2	100 100	75 75			TH
UDH	802 310 000		20				60		REC		20mA	B5	R
UDT1	023 186 090	G <sub>1</sub>	15	3	200		10.3	3	150		3	8SC	DDT
UE2	123 180 090		50				60		REC		20mA	8SC	RR
UF5	023 110 560	G <sub>1</sub>	12.5	2.5	100	100	3.2	2.2	100	100	2.2	8SC	P
UF6	023 110 560	G <sub>1</sub>	12.5	2	100	100	3	1.8	100	100	1.8	8SC	P
UF9	206 501 130	G <sub>1</sub>	12.5	2.5	200	100	6	2.2	100	100	2.2	A08	P
UF2I	265 104 130		22.5	2.5	200	100	6	2.2	100	100	2.2	B8B	P
UF4I	260 154 130		12	3	200	125	7.2	2.3	100	150	2.3	B8A	P
UF42	260 154 130		21	2	175	175	10	8.5	100	150	8	B8A	P
UH4	893 200 000		4				5		D			B5	RR
ULP	642 310 000		13	20	250		27	4	100		4	B5	T
UL1	206 540 130		60	11.5	200	200	55	8.5	100	PenLF	8	A08	P
UL2	023 104 560		35	5	200	200	20	7	100	PenLF	6	8SC	P
UL2I	265 004 130		45	13	200	200	55	8	100	PenLF	7	B8B	P
UL4I	261 054 130		45	9	175	175	54.5	9.5	100	100	7	B8A	P
UL44	2** 154 130	A	45	13.5	175	175	30	7.1	100	100	6.5	B8A	P
UL46	261 054 130		45	9	175	175	54.5	9.5	100	100	7	B8A	P
UPX	642 310 000		25	34	250		38	7	100		7	B5	P
UP2	023 140 560		25	19	200	100	40	3	100	75	3	8SC	P
UR1C	802 310 000		20				60		REC		20mA	B5	R
UR3C	091 231 800		30				60		REC		20mA	B7	RR
UT2	023 100 060	G <sub>1</sub>	15	5	200		6	3	100		3	8SC	T
UU4	892 300 000		4				60		REC		20mA	B4	RR
UU5	892 300 000		4				60		REC		20mA	B4	RR
UU6	208 090 030		4				60		REC		20mA	M08	RR
UU7	208 090 030		4				60		REC		20mA	M08	RR
UU8	208 090 030		4				120		REC		30mA	M08	RR
UU9	29* **8 130		6				30		REC		15mA	B8A	RR
UU60/250	892 300 000		4				30		REC		15mA	B4	RR
UUI20/350	892 300 000		4				60		REC		20mA	B4	RR
UUI20/500	892 300 000		4				60		REC		20mA	B4	RR
UY1	388 028 120		50				120		REC		30mA	A08	R
UY1(N)	388 028 120		50				120		REC		30mA	A08	R
UY2I	280 80* 130		50				120		REC		30mA	B8B	R
UY3I	020 080 310		50				120		REC		30mA	A08	R
UY4I	280 000 130		31				60		REC		20mA	B8A	R
UY42	280 *0* 130		31				60		REC		20mA	B8A	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

D	023 000 000	D <sub>1</sub>	1-4						D		B3G	U37
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RR	028 090 310		6				30		Rec	15mA	A08	U147
RR	280 009 130		6				30		Rec	17mA	B8A	U150
R	020 080 310		28				120		Rec	30mA	A08	U281

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
U4C	642 300 000		4	12	200		35	3.2	100		3.2	B4	T
U8	892 300 000		7.5				60		REC		20mA	B4	RR
U9	892 300 000		4				30		REC		15mA	B4	RR
U10	892 300 000		4				30		REC		15mA	B4	RR
U12	892 300 000		4				60		REC		20mA	B4	RR
U12/14	892 300 000		4				60		REC		20mA	B4	RR
U14	892 300 000		4				60		REC		20mA	B4	RR
U15	802 300 000		6				120		REC		30mA	B4	R
U16	002 300 000	D <sub>1</sub>	2				5		REC		5mA	B4	R
U17	002 300 000	D <sub>1</sub>	4				30		REC		15mA	B4	R
U18	892 300 000		4				120		REC		30mA	B4	RR
U18/20	892 300 000		4				120		REC		30mA	B4	RR
U19/23	002 300 000	D <sub>1</sub>	4				120		REC		30mA	B4	R
U20	892 300 000		4				60		REC		20mA	B4	RR
U21	002 300 000	D <sub>1</sub>	2				5		REC		5mA	B4	R
U22	200 000 030	D <sub>1</sub>	2						D			M08	D
U22FH	200 000 030	D <sub>1</sub>	2						D			M08	D
U23	002 300 000	D <sub>1</sub>	4				120		REC		30mA	B4	R
U24	020 000 300	D <sub>1</sub>	2				1.0		REC		2mA	A08	R
U26	391 221 800		13				60		REC		20mA	B7	RR
U29	002 300 000	D <sub>1</sub>	2				15		REC		30mA	B5	R
U30	391 221 800		13				60		REC		20mA	B7	RR
U31	020 080 310		26				120		REC		30mA	A08	R
U33	002 300 000	D <sub>1</sub>	2				3		D			B4	R
U35	*20 000 030	D <sub>1</sub>	1.4				2		D			A08	R
U50	020 908 030		5				60		REC		20mA	A08	RR
U52	030 908 020		5				120		REC		30mA	A08	RR
U70	028 090 310		6				30		REC		15mA	A08	RR
U71	020 080 310		30				60		REC		20mA	A08	R
U74	020 080 310		30				120		REC		30mA	A08	R
U76	020 080 310		30				120		REC		30mA	A08	R
U78	802 309 100		6				30		REC		15mA	B7G	RR
U81	**9 **8 230		6				60		REC		20mA	B8B	RR
U82	209 008 130		6				30		REC		15mA	B8B	RR
U84	009 **8 230		4				30		REC		15mA	B8B	RR
U101	280 008 130		50				120		REC		30mA	B8B	R
U107	281 008 300		40				60		REC		20mA	B7G	R
U134	028 190 310		13				60		REC		20mA	A08	RR
U142	280 000 130		31				60		REC		20mA	B8A	R
U143	020 908 030		4				30		REC		15mA	A08	RR
U145	280 *** 130		40				60		REC		20mA	B8A	R
U149	209 008 130		6				30		REC		15mA	B8B	RR
U201	020 080 310		20				60		REC		20mA	A08	R
U403	201 080 030		40				120		REC		30mA	M08	R
U404	280 *** 130		40				60		REC		20mA	B8A	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

H	545 231 600	G <sub>1</sub>	13	1·5	200	100	3·2		100	100		B7	VHTA
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D	2** 00* 300	D <sub>1</sub>	1·4						D			B7G	VM1
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P	041 231 500	A	4	3	250	100	5·5	2	100	90	2	B7	VPT4
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H	065 231 500	G <sub>1</sub>	2	1·5	150	60	2	1·4	100	60	1·4	B7	(MUL.)VP2B
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
U415	642 300 000		4	10-5	150		5	1-4	100		1-4	B4	T
U418	642 300 000		4	13	150		10	1-6	100		1-6	B4	T
U650	802 300 000		6				30		REC		15mA	B4	R
U801	128 899 310		80				120		REC		30mA	A08	RR
U4020	802 310 000		40				120		REC		30mA	B5	R
VCI	023 100 060	G <sub>1</sub>	55	2	200		6	3	200		3	8SC	T
VDSB	542 310 000	A	16		200	75		3	100	75	3	B5	P
VDS	542 310 000	A	16	2	200	75		1-6	100	75	1-6	B5	P
VHPI3	041 231 500	A	13	1-5	200	100	4	2	100	100	4	B7	P
VHTA	123 164 550	G <sub>1</sub>	13	1-5	250	100	3-2		100	100		8SC	H
VHTS	645 231 500	G <sub>1</sub>	13	3	200	100	2-6		100	100		B7	H
VHT2	645 230 600	G <sub>1</sub>	2		125	75			100	75		B7	H
VHT2A	645 230 600	G <sub>1</sub>	2	0	125	50			100	60		B7	H
VHT4	545 231 600	G <sub>1</sub>	4	3	200	100	3-6		100	100		B7	H
VLS61	002 300 000	D <sub>1</sub>	2				3		D			B4	R
VMP4	542 310 000	A	4	1	250	100		3-5	200	100	3-5	B5	P
VMP4G	041 231 500	A	4	2	250	100	8	2-7	100	100	2-7	B7	P
VMS4	542 310 000	A	4	1	200	80	14	2-4	200	80	2-4	B5	P
VMS4B	542 310 000	A	4	1	200	80	8	2-9	200	80	2-9	B5	P
VM4V	542 310 000	A	4	1	200	80	14	2-4	200	80	2-4	B5	P
V02	645 320 600	G <sub>1</sub>	2	0	150	90	1-8		150	90		B7	H
V02S	023 064 560	G <sub>1</sub>	2	0	150	50	2-0		No Data Available			8SC	H
V04	645 231 500	G <sub>1</sub>	4	1-5	250	75	1-6		100	75		B7	H
V04S	023 154 560	G <sub>1</sub>	4	1-5	250	75	1-6		100	75		8SC	H
V06	123 164 560	G <sub>1</sub>	6	3	100	100	4-6		100	100		8SC	H
V013	645 231 500	G <sub>1</sub>	13	1-5	250	75	1-6		100	75		B7	H
V013(S)	123 154 560	G <sub>1</sub>	13	1-5	250	75	1-6		100	75		8SC	H
VPTA	041 231 500	A	13	2	250	100	4-2	2-9	100	100	2-9	B7	P
VPTS	041 231 500	A	13	3	200	100	5-5	2-6	100	90	2-6	B7	P
VPT2	542 300 000	A	2	1-5	125	60	1-5	1-1	125	60	1-1	B4	P
VPT2	041 230 500	A	2	1-5	125	60	1-5	1-1	125	60	1-1	B7	P
VPT4	542 310 000	A	4	3	250	100	5-5	2	100	90	2	B5	P
VPT4B	041 231 500	A	4	3	250	100	6	3-2	100	90	3-2	B7	P
VP2	041 230 500	A	2	1	150	150	3	1-5	150	150	1-5	B7	P
VP2B	061 230 500	G <sub>1</sub>	2	1-0	150	150	2-5	0-65	150	150	0-6	B7	P
VP2B	032 004 560		2	1-5	150	150	2-5	0-65	150	150	0-6	8SC	P
VP2BS	032 010 560	G <sub>1</sub>	2	1	150	150	2-5	0-65	150	150	0-6	8SC	P
VP2D	061 230 500	G <sub>1</sub>	2	1-5	150	75	1-3	2-0	150	75	2	B7	P
VP4	542 310 000	A	4	2	200	100	4-5	2-3	100	100	2-3	B5	P
VP4	041 231 500	A	4	2	200	100	4-5	2-3	100	100	2-3	B7	P
VP4A	542 310 000	A	4	2	200	100	4-25	2-5	100	100	2-5	B5	P
VP4A	041 231 500	A	4	2	200	100	4-25	2-5	100	100	2-5	B7	P
VP4B	061 231 500	G <sub>1</sub>	4	3	250	250	11-5	2	100	150	2	B7	P
VP4C	041 231 500	A	4	2	250	250	11-5	4	100	150	4	B7	P
VP4S	023 110 560	G <sub>1</sub>	4	3	250	100	8	1-8	100	90	1-8	8SC	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
VP4S	061 231 500	G <sub>1</sub>	4	3	250	100	8	1.8	100	90	1.8	B7	P
VPI2D	026 985 310	G <sub>1</sub>	13	3	250	125	9	1.1	100	100	1.1	A08	DDP
VPI3	041 231 500	A	13	1.5	200	100	6.3	3	100	100	3	B7	P
VPI3	061 231 500	G <sub>1</sub>	13	3	200	100	8	2.8	100	100	2.8	B7	P
VPI3A	023 110 560	G <sub>1</sub>	13	2	200	100	4	2.2	100	100	2.2	8SC	P
VPI3B	061 231 500	G <sub>1</sub>	13	2	200	200	9	2.2	200	200	2.2	B7	P
VPI3C	061 231 500	G <sub>1</sub>	13	2	200	200	9	2.2	200	200	2.2	B7	P
VPI3K	061 231 500	G <sub>1</sub>	13	3	200	100	8	2	100	100	2	B7	P
VPI3S	061 231 500	G <sub>1</sub>	13	3	200	100	8	2.8	100	100	2.8	B7	P
VPI3S	023 110 560	G <sub>1</sub>	13	3	200	100	8	2.8	100	100	2.8	8SC	P
VP21	041 230 500	A	2	1	150	60	2.8	1.1	150	60	1.1	B7	P
VP22	206 510 030	G <sub>1</sub>	2	1.5	125	60	1.2	0.8	100	60	0.8	M08	P
VP23	206 510 030	G <sub>1</sub>	2	1.5	125	60	1.4	1.0	100	60	1.0	M08	P
VP41	216 510 030	G <sub>1</sub>	4	2.7	250	200	7.7	2.0	100	150	2	M08	P
VP41	061 231 500	G <sub>1</sub>	4	3.5	250	250	11	3.1	100	200	3.1	B7	P
VPI33	216 510 030	G <sub>1</sub>	13	2.7	150	150	8	2.1	100	125	2.1	M08	P
VP210	041 230 500	A	2	1.5	125	60	1.1	0.82	100	60	0.8	B7	P
VP215	542 300 000	A	2	1	150	75	3.75	1.25	150	75	1.25	B4	P
VP215	041 230 500	A	2	1	150	75	3.75	1.25	150	75	1.25	B7	P
VP215B	061 230 500	G <sub>1</sub>	2	1	125	125	3.25	1.2	125	125	1.2	B7	P
VP215C	041 230 500	A	2	1	125	125	3.25	1.2	125	125	1.2	B7	P
VPI320	041 231 500	A	13	2.7	250	100	5	2	100	100	2	B7	P
VPI321	041 231 500	A	13	2.8	250	200	7.4	2	175	175	2	B7	P
VPI322	061 231 500	G <sub>1</sub>	13	2.8	250	200	7.4	2	100	100	2	B7	P
VSGAI	542 310 000	A	4	1.5	200	100	7	6.15	100	100	6	B5	P
VS2	542 300 000	A	2	2.5	125	60	2	1.4	100	60	1.4	B4	P
VS24	542 300 000	A	2	1	150	75	4.4	1.5	150	75	1.5	B4c	P
VS24K	542 300 000	A	2	1	150	75	4.4	1.5	150	75	1.5	B4	P
VS215	542 300 000	A	2	1	150	75	6	1.0	150	75	1.0	B4	P
VTP4	542 310 000	A	4	3	200	100	5.5	2	100	100	2	B5	P
VT1	642 310 000		4	5	200		5	2	100		2	B5	T
VT2	642 310 000		4	2	200		3	1.9	175		1.9	B5	T
VX2	061 235 500	G <sub>1</sub>	2	1	150	60	1		150	60		B7	P
VX2S	023 015 560	G <sub>1</sub>	2	1	150	60	1		150	60		8SC	P
VX4	515 231 600	G <sub>1</sub>	4	2	250	75	1.8		100	75		B7	P
VX4S	023 115 560	G <sub>1</sub>	4	2	250	75	1.8		100	75		8SC	P
VX6S	023 115 560	G <sub>1</sub>	6	3	250	100	1.85	4	100	100	4	8SC	P
VX13	515 231 600	G <sub>1</sub>	13	2	250	75	1.8		100	75		8SC	P
VX13S	023 115 560	G <sub>1</sub>	13	2	250	75	1.8		100	75		8SC	P
VY1	023 100 080		55				60		REC		20mA	8SC	R
V20s	023 100 080		20				60		REC		20mA	8SC	R
V20	802 310 000		20				60		REC		20mA	B5	R
V20/7000	002 300 000	D <sub>1</sub>	4				15		REC		10mA	B4	R
V25	081 231 900		25				60		REC		20mA	B7	RR
V30	802 310 000		30				120		REC		30mA	B5	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	041 230 500	A	3		250	250	16	5	100	PenLF	5	B7	V245
P	200 540 030	A	2	10	150	150	32	5.2	100	100	5	M08	V248A
P	045 231 000	A	6	9.75	200	200	40	8.7	100	100	7	B7	V1120
P	040 231 500	A	4	9.75	200	200	40	8.7	100	100	7	B7	V1120B
DP	268 154 130		6	2	250	100	5	2.1	100	100	2	B8A	WD150
P	026 510 310	G <sub>1</sub>	6	2.5	250	100	6	2.2	100	100	2	A08	W147
P	265 104 130		6	3	250	100	8.5	1.75	100	90	1.7	B8B	W149
P	261 154 130		6	2.5	250	250	6	2.2	100	150	2.2	B8A	W150

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
V99	263 400 000		3	4.5	90		2.5	0.425	80		0.4	UX4	T
V312	602 310 000	G <sub>1</sub>	4	4.8	250		6	2.3	100		2.3	B5	T
V453	206 510 030	G <sub>1</sub>	4	1.75	250	100	4.5	2.0	100	100	2	M08	P
V503	642 300 000		4	85	400		100	4.5	100		4.5	B4	T
V872	216 510 030	G <sub>1</sub>	6	4	200	200	6.7	3.35	100	150	3.3	M08	P
V914	892 310 000		4						D			B5	D
V960	002 300 000	D <sub>1</sub>	4				60		REC		20mA	B4	R
VI906	002 300 000	D <sub>1</sub>	4				60		REC		20mA	B4	R
VI907	002 300 000	D <sub>1</sub>	4				60		REC		20mA	B4	R
V2018	002 300 000	D <sub>1</sub>	20				30		REC		15mA	B4	R
V2118	802 310 000		20				60		REC		20mA	B5	R
WD30	560 231 890	G <sub>1</sub>	13	1	250	100	7	2.6	250	100	2.6	B9	DDP
WD40	560 231 890	G <sub>1</sub>	4		250	100		3.5	100	100	3.5	B9	DDP
WD142	268 154 130		13		200	200		1.9	100	100	1.9	B8A	DDP
W17	265 024 300		1.4	1	90	75	3.5	0.9	80	75	0.9	B7G	P
W21	542 300 000	A	2	1	150	125	3.6	1.4	150	125	1.4	B4	P
W30	041 231 500	A	13	1	250	250	12	4	250	250	4	B7	P
W31	041 231 500	A	13	3	250	100	8	2.7	100	90	2.7	B7	P
W42	061 231 500	G <sub>1</sub>	4	3	250	125	7.6	1.5	100	100	1.5	B7	P
W61	026 510 310	G <sub>1</sub>	6	3	250	75	8.5	2.9	100	75	2.9	A08	P
W63	026 510 310	G <sub>1</sub>	6	3	250	100	7.6	1.5	100	90	1.5	A08	P
W76	026 510 310	G <sub>1</sub>	13	3	250	100	7.6	1.5	100	90	1.5	A08	P
W77	412 361 500		6	2.5	200	200	8	2.5	100	150	2.5	B7G	P
W81	265 104 130		6	3.0	250	100	8	2.8	100	90	2.8	B8B	P
W101	265 104 130		19	3	250	100	8	2.8	100	90	2.8	B8B	P
W107	412 361 500		12.5	2.5	200	200	8	2.5	100	175	2.5	B7G	P
W143	265 104 130		6	2.5	250	100	6	2.2	100	100	2.2	B8B	P
W145	260 154 130		13	2.5	175	100	7	2.3	100	100	2.3	B8A	P
W148	265 104 130		6	2.5	250	150	9.5	3.8	100	150	3.8	B8B	P
W213	642 300 000		2	2.5	150		1	1.2	150		1.2	B4	T
W318	809 231 600	G <sub>1</sub>	4	2	100		3.5	2.5	100		2.5	B7	DDT
XD	642 300 000		2	1.5	75		2.5	0.75	80		0.7	Sm4	T
XD2.0V	642 300 000		2	1	50		0.65	0.56	No Data Available			Sm4	T
XH2.0V	642 300 000		2	1	50		0.45	0.56	No Data Available			Sm4	T
XL	642 300 000		2	1.5	75		1.5	0.85	80		0.8	Sm4	T
XL02.0V	642 300 000		2	1	50		1.1	0.92	No Data Available			Sm4	T
XL2.0V	642 300 000		2	1	50		1.0	0.84	No Data Available			Sm4	T
XP	642 300 000		2	4.5	75		4	1	80		1	Sm4	T
XP2	642 300 000		2	4.5	75		4	1	80		1	Sm4	T
XP2.0V	642 300 000		2	3	50		2	1.0	No Data Available			Sm4	T
XSG	542 300 000	A	2		125	60	1.75	0.6	100	60	0.6	Sm4	P
XSG2.0V	542 300 000	A	2	0	50	30	0.6	0.4	No Data Available			Sm4	P
XVS2.0V	542 300 000	A	2	1	50	30	0.4	0.33	No Data Available			Sm4	P
XW2.0V	251 630 000	G <sub>1</sub>	2	1	50	50	0.95	0.6	No Data Available			Sm5	P
XY	254 630 000		2	3	75	75	2		80	60	1	Sm5	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

TH	54I 237 46*		6	$\begin{Bmatrix} 0 \\ 3 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 250 \end{Bmatrix}$	$\begin{Bmatrix} 75 \\ 75 \end{Bmatrix}$	$\begin{Bmatrix} 10 \\ 2.9 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 75 \\ 75 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	B9A	X79
TH	54I 237 46*		19	$\begin{Bmatrix} 0 \\ 3 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 250 \end{Bmatrix}$	$\begin{Bmatrix} 75 \\ 75 \end{Bmatrix}$	$\begin{Bmatrix} 10 \\ 2.9 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 75 \\ 75 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	B9A	X109
TH	027 546 310	G <sub>1</sub>	6	$\begin{Bmatrix} 0 \\ 2 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 250 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 3 \\ 3 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	A08	X147
TH	276 454 130		6	$\begin{Bmatrix} 0 \\ 2.5 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 250 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 3.6 \\ 3.6 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 100 \end{Bmatrix}$	$\begin{Bmatrix} 2.8 \\ 2.8 \end{Bmatrix}$	B8A	X150

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
XY2.0V	246 530 000		2	2	50	50	1.75	2.4	No Data	Available		Sm5	P
X14	026 546 300	G <sub>1</sub>	1.4	0	90	50	1.8	0.5	80	60	0.5	A08	P
X17	266 424 300		1.4	0	75			1.4	75		1.4	B7G	H
X21	645 230 600	G <sub>1</sub>	2	0	150	75			100	75		B7	H
X22	645 320 600	G <sub>1</sub>	2	0	150	75			100	75		B7	H
X23	645 231 700	G <sub>1</sub>	2	{ —	100		2.1		100			B7	TH
				{ 1.5	150	60	0.7		100	60			
X24	645 231 700	G <sub>1</sub>	2	{ —	100		2.1		100			B7	TH
				{ 1.5	150	60	0.7		100	60			
X30	645 231 600	G <sub>1</sub>	13	3	150	75	7		100	75		B7	H
X31	645 231 700	G <sub>1</sub>	13	{ —	150		2.2		150			B7	TH
				{ —	250	75	2.3		100	75			
X32	645 231 600	G <sub>1</sub>	13	3	150	75	7		100	75		B7	H
X41	645 231 700	G <sub>1</sub>	4	{ 6	150		2.2		150		1.8	B7	TH
				{ 1.5	250	75	2.3		100	75	2.0		
X42	645 231 600	G <sub>1</sub>	4	3	250	100	7		100	100		B7	H
X61	027 546 310	G <sub>1</sub>	6	{ —	200				100	100		A08	TH
				{ 3	250	100			150				
X63	026 545 310	G <sub>1</sub>	6	3	250	100	6		100	100	1.6	A08	H
X64	026 510 310	G <sub>1</sub>	6	6	250	150	3.25		100	100		A08	H
X65	027 546 310	G <sub>1</sub>	6	{ 3	100		4.5		100	100	1	A08	TH
				{ 3	250	100	2		100		0.5		
X66	027 546 310	G <sub>1</sub>	6	{ 0	100		4.5		100	100	1	A08	TH
				{ 3	250	100	2		100		1.3		
X71	027 546 310	G <sub>1</sub>	15	{ —	100				100	100		A08	TH
				{ 3	250	100			150				
X73	026 546 310	G <sub>1</sub>	6	3	150	75			100	75		A08	H
X76	027 546 310	G <sub>1</sub>	13	{ —	100				100			A08	TH
				{ —	250	100			100	100			
X77	412 366 100		6	2	100		12	6.5	100		6.5	B7G	H
X78	542 376 400		6	{ 0	100		10	2.8	100		2.8		
				{ 0	250	75	9		100	75		B7G	TH
X81	276 454 130		6	{ 2	100		3		100	100		B8B	TH
				{ 2	250	100	3		100				
X101	276 454 130	G <sub>1</sub>	19	{ 2	100		3		100	100		B8B	TH
				{ —	250	100	3		100				
X108	542 376 400		19	{ 0	100		10	2.8	100		2.8		
				{ 0	250	75	9		100	75		B7G	TH
X142	265 454 130		14	—	200	125			100	125		B8A	H
X143	276 454 131		6	{ —	150		4.5		100	100		B8B	TH
				{ 2	250	100	3		150				
X145	265 454 130		28	2.5	175	100	3		100	100		B8A	TH
X148	266 454 130		6	2	250	100	1.7		100	100		B8B	H
Y13	045 231 600		13	22	250	250	35		100	150		B7	P
Y220	642 300 000	S	2	4.5	150	150	10.5		100	125		B4	P
Y220	642 350 000		2	4.5	150	150	10.5		100	125		B5	P
Y230	642 350 000		2	3	150	150	7		100	125		B5	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	260 154 130		21	2	175	175	10	8.5	100	150	8	B8A	Z142
P	260 154 130		6	2	250	250	10	9.5	100	150	8	B8A	Z150

P	365 004 220		1.2	1.5	150	150	6.8	1.35	No Data Available			B8B	IAB5
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
ZD	892 310 000		13						D			B5	DD
ZD17	208 564 300		1.4	1	90	90	2.7	0.63	80	90	0.6	B7G	DP
Z14	036 500 200	G <sub>1</sub>	1.4	1	90	90	1.2	0.75	80	90	0.7	A08	P
Z21	542 300 000	A	2	1	150	125	2.5	1.7	150	125	1.7	B4	P
Z22	041 230 500	A	2	1	150	125	2.5	1.7	150	125	1.7	B7	P
Z26	045 231 600		26	5.5	250	250	32		100	PenLF		B7	P
Z62	026 510 310	G <sub>1</sub>	6	2	300	150	10	7.5	100	125	7.5	A08	P
Z63	026 500 310	G <sub>1</sub>	6	2	250	100	1.0	1.23	100	100	1.2	A08	P
Z66	026 510 310	G <sub>1</sub>	6	1.5	200	200	10.9	8.5	100	150	8.0	A08	P
Z73	026 510 310	G <sub>1</sub>	6	3	250	100	6.5	1.7	100	90	1.7	A08	P
Z77	412 361 500		6	2	250	250	10	5.0	100	150	5.0	B7G	P
Z90	256 101 403		6	2	250	250	10	6.0	100	150	6.0	B9G	P
Z220	642 300 000	S	2	6	150	150	18		100	100		B4	P
Z220	642 350 000		2	6	150	150	18		100	100		B5	P
OZ4	007 060 010		—		250		60	3KΩ				A08	CCR
00A	364 200 000		5	0	45		1.5	0.66	No Data Available			UX4	T
01A	364 200 000		5	4.5	90		2.5	0.725	80		0.72	UX4	T
I	281 300 000		6				60		REC		20mA	UX4	R
IA3	281 0*8 300		1.4						D			B7G	D
IA4E	365 200 000	G <sub>1</sub>	2	3	150	75	2.2	0.65	100	75	0.6	UX4	P
IA4P	365 200 000	G <sub>1</sub>	2	3	90	75	2.2	0.72	80	75	0.7	UX4	P
IA4T	265 300 000	G <sub>1</sub>	2	3	150	75	2.2	0.625	100	75	0.6	UX4	P
IA5	036 540 200		1.4	4.5	90	90	4	0.85	80	75	0.8	A08	P
IA6	266 453 000	G <sub>1</sub>	2	0	150	75	3	0.425	80	60	0.4	UX6	P
IA7	026 546 300		1.4	0	90	50		0.55	80	60	0.5	A08	P
IB4P	365 200 000	G <sub>1</sub>	2	3	90	75	1.6	0.6	80	60	0.6	UX4	P
IB4(T)	265 300 000	G <sub>1</sub>	2	3	175	75	1.7	0.65	100	60	0.6	UX4	P
IB5	268 943 000		2	3	150		0.8	0.57	100		0.5	UX6	DDT
IB6	265 406 300		1.4	1.5	90	75	1.5	0.75	80	75	0.75	B7G	P
IB7	026 546 300		1.4	0	90	50		0.875	80	60	0.8	A08	P
IB8	037 546 280		1.4	0	90		0.15	0.27	80		0.15	A08	DTP
				6	90	90	6.3	1.15	80	75	1.1		
IC1	265 424 300		1.4	0	90	75	1.6		80	75		B7G	P
IC4	365 200 000	G <sub>1</sub>	2	0	175	75	2.5	1	175	75	1	UX4	P
IC5	036 540 200		1.4	7.5	90	90	7.5	1.55	80	75	1.5	A08	P
IC6	366 452 000	G <sub>1</sub>	2	0	175	75		1.05	175	75	1.05	UX6	P
IC7	026 546 300	G <sub>1</sub>	2	3	150	75	1.3		175	75	1.05	A08	P
ID4	264 530 000		2	6	175	175	9.5		100	100		UX5	P
ID5	802 310 000		40				120		REC		30mA	B5	R
ID5GP	036 500 200	G <sub>1</sub>	2	3	90	75	2.2	0.72	80	60	0.7	A08	P
ID5GT	036 500 200	G <sub>1</sub>	2	3	150	75	2.2	0.65	100	60	0.6	A08	P
ID6	280 183 000		25				60		REC		20mA	UX6	R
ID7	036 546 200	G <sub>1</sub>	2						175	75	1.05	A08	P
ID8	037 546 280	G <sub>1</sub>	1.4	9	90	90	1.1	0.575	80		0.5	A08	DTP
				9	90		5	0.925	80	75	0.9		

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

H	266 454 300		1-4	0	90	50	4	0-55	No Data Available		B7G	1L6
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
ID13	281 0*8 300		1-4						D			B7G	D
IE4	026 040 300		1-4	3	90		1-4	0-76	80		0-76	A08	T
IE5GP	036 500 200	G <sub>1</sub>	2	3	90	75	1-6	0-6	80	60	0-6	A08	P
IE5	036 500 200	G <sub>1</sub>	2	3	175	75	1-7	0-65	100	60	0-6	A08	P
IE7	036 447 250		2	4-5	150	150	7-5	1-452	100	100	1-4	A08	P
IFD9	208 564 300		1-4	1	75	75	1-6	0-63	80	75	0-63	B7G	P
IF2	265 024 300		1-4	1	90	75	2-9	0-92	80	75	0-92	B7G	P
IF3	265 024 300		1-4	1	90	50	1-8	0-75	80	60	0-75	B7G	P
IF4	364 520 000		2	3	90	90	4	1-4	80	75	1-4	UX5	P
IF5	036 540 200		2	3	90	90	4	1-4	80	75	1-4	A08	P
IF6	365 892 000	G <sub>1</sub>	2	1-5	175	75	2-2	0-65	175	75	0-6	UX6	DDP
IF7	036 985 200	G <sub>1</sub>	2	1-5	175	75	2-2	0-65	175	75	0-6	A08	DDP
IF7GV	036 895 200	G <sub>1</sub>	2	1-5	175	75	2-2	0-65	175	75	0-6	A08	P
IG4	036 040 200		1-4	6	90		2-3	0-825	80		0-825	A08	T
IG5	036 540 200		2	6	90	90	8-5	1-5	80	75		A08	P
IG6	026 447 300		1-4	0	90		1-0	0-675	80		0-67	A08	TT
IH4	206 040 300		2	9	150		3	0-9	100		0-9	A08	T
IH5	036 080 200	G <sub>1</sub>	1-4	0	90		0-15	0-275	80		0-27	A08	DT
IH6	036 894 200		2	3	150		0-8	0-575	100		0-57	A08	DDT
IJ5	036 540 200		2	16-5	150	150	7	0-95	100	100	0-9	A08	P
IJ6	026 447 300		2	3	150		1-7		100			A08	TT
IJ6GX	026 447 300		2	0	125		5		125			A08	TT
IK4	365 200 000	G <sub>1</sub>	2	0	150	75	2-5	1-05	150	75	1-05	UX4	P
IK5	026 500 300	G <sub>1</sub>	2	0	125	75	2-5	1-05	125	75	1-05	A08	P
IK6	365 892 000	G <sub>1</sub>	2	3	150	90	0-9	0-6	100	75	0-6	UX6	P
IK7	026 895 300	G <sub>1</sub>	2	4-5	125	150	1-5	0-7	100	125	0-7	A08	DDP
ILA4	365 004 020		1-4	4-5	90	90	4	0-85	80	75	0-85	B8B	P
ILA4E	365 004 020		1-4	4-5	90	90	3-5	0-8	80	75	0-8	B8B	P
ILA6	366 454 020		1-4	0	90	50		0-55	80	60	0-5	B8B	P
ILA6E	366 454 020		1-4	0	90	50		0-55	80	60	0-5	B8B	P
ILB4	365 004 020		1-4	9	90	90	5	0-925	80	75	0-9	B8B	P
ILB6	276 554 430		1-4	0	75		1-2		80			B8B	H
ILC5	365 124 020		1-4	0	90	50	1-15	0-775	80	60	0-77	B8B	P
ILC6	266 454 030		1-4	0	90	50	3	0-55	80	60	0-5	B8B	P
ILD5	365 904 020		1-4	0	90	50	0-6	0-578	80	60	0-5	B8B	P
ILE3	360 0*4 020		1-4	3	90		1-4	0-76	80		0-76	B8B	T
ILF3	360 004 020		1-4	3	90		1-4	0-76	80		0-76	B8B	P
ILG5	365 124 020		1-4	1-5	90	90	3-7	1-15	80	90	1-15	B8B	P
ILH4	360 804 020		1-4	0	90		0-15	0-275	80		0-27	B8B	DT
ILN5	365 124 020		1-4	0	90	90	1-6	0-8	80	90	0-8	B8B	P
ILN5E	365 124 020		1-4	0	90	90	1-6	0-8	80	90	0-8	B8B	P
IL4	265 024 300		1-4	0	90	75	2-9	0-925	80	75	0-9	B7G	P
IL5	026 540 300		2	6	175	175	9-5	2-4	100	150	2-4	A08	P
IM5G	036 500 200	G <sub>1</sub>	2	0	150	75	2-5	1	150	75	1	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

D	*** 23* **8		0.625						D			B9A	IV2
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R	300 200 000	D <sub>1</sub>	2.5				5		D			UX4	2B21
D	021 010 310	D <sub>1</sub>	6						D			A08	2B22
R	280 300 000		2.5				120		Rec		30mA	UX4	2B26
D	123 000 000	D <sub>1</sub>	6						D			B3G	2B35
D	123 000 000	D <sub>1</sub>	4						D			B3G	2B36
T	264 300 000		7.5	32	350		16	1.55	100		1.5	UX4	2C23
P	265 004 130		6	15	250	250	70		100	150		B8B	2C48
P	265 004 130		6	15	250	250	70		100	150		B8B	2C50

P	235 242 300	A	3	18.5	400	200	16	3.2	200	100	3.2	A08	2E24
P	125 141 300	A	6	20	200	200	20	3.5	100	80	3.5	A08	2E26

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
IN5	036 500 200	G <sub>1</sub>	1.4	0	90	90	1.2	0.750	80	90	0.75	A08	P
IN6	036 548 200		1.4	4.5	90	90	3.4	0.8	80	75	0.8	A08	DP
IP5	036 500 200	G <sub>1</sub>	1.4	0	90	90	2.3	0.75	80	90	0.75	A08	P
IP10	264 536 200		1.4	7	90	75	7.4	1.57	80	60	1.57	B7G	P
IP11	365 024 300		1.4	4.5	90	90	9.5	2.15	80	75	2	B7G	P
IQ5	036 540 200		1.4	4.5	90	90	9.5	2.2	80	75	2.2	A08	P
IR	026 510 300		1.4	0	90	90	1.2	0.75	80	90	0.75	A08	P
IR4	200 800 130		1.4						D			B8B	D
IR5	266 424 300		1.4	0	75			1.4	80		1.4	B7G	T
ISA6	021 405 360		1.4	0	90	75	2.45	0.97	80	75	0.97	A08	P
ISB6	036 580 240		1.4	0	90	75	1.45	0.665	80	75	0.66	A08	DP
IS4	264 526 300		1.4	7	90	75	7.4	1.575	80	60	1.5	B7G	P
IS5	208 564 300		1.4	0	75	75	1.6	0.625	80	75	0.625	B7G	DP
IT	036 500 320	G <sub>1</sub>	1.4	4.5	90	90	9.9	2.1	80	75	2.1	A08	P
IT4	265 024 300		1.4	0	90	75	3.5	0.9	80	75	0.9	B7G	P
IT5	036 540 200		1.4	6	90	90	6.5	1.15	80	75	1.15	A08	P
IU4	265 024 300		1.4	0	90	90	1.6	0.9	80	90	0.9	B7G	P
IU5	265 804 300		1.4	0	75	75	1.6	0.625	80	75	0.6	B7G	DP
IV	281 300 000		6				60		REC		20mA	UX4	R
IZ2	232 232 300	D <sub>1</sub>	1.4				2		D			B7G	R
2	642 300 000		2	4	150		1.5		100			B4	T
2A3	264 300 000		2.5	45	250		60	5.2	100		5.2	UX4	T
2A3H	364 200 000		2.5	62	300		40	5.25	100		5.25	UX4	T
2A5	265 413 000		2.5	16.5	250	250	34	2.5	100	PenLF	2.5	UX6	P
2A6	268 913 000	G <sub>1</sub>	2.5	2	250		0.9	1.1	150		1.1	UX6	DDT
2A7	275 641 300	G <sub>1</sub>	2.5	— 1.5	100 250	50	2 1.1		100 100			Sm7	H
2B7	265 891 300	G <sub>1</sub>	2.5	3	250	125	9	1.125	100	60		UX7	DDP
2B7S	265 891 300	G <sub>1</sub>	2.5	3	250	100	6	1	100	100	1.12	UX7	DDP
2B25	200 800 300		1.4						D			B7G	D
2C21	217 461 300	G <sub>1</sub>	6	16.5	250		8.3	1.375	100		1.37	UX7	TT
2C22	020 000 310	A G <sub>1</sub>	6	10.5	300		11	3	100		3	A08	T
2C26	020 000 310	A <sub>1</sub> G <sub>1</sub>	6	15	350		16		100			A08	T
2C51	214 607 413		6	2	150		8.2	5.5	125		5.5	B9A	TT
2C52	461 471 230		12.5	2	250		1.3	1.9	200		1.9	A08	TT
2D1	289 130 000		2.5						D			UX5	DD
2D2	892 310 000		2						D			B5	DD
2D4	892 310 000		4						D			B5	DD
2D4A	892 310 000		4						D			B5	DD
2D4B	091 231 800		4						D			B7	DD
2D13C	892 310 000		13						D			B5	DD
2E22	254 130 000	A <sub>1</sub>	6		400	250	100		100	PenLF		UX5	P
2E30	413 365 200		3	20	250	250	40	3.7	100	PenLF	3.7	B7G	P
2HMD	452 310 000	A <sub>1</sub> A <sub>2</sub>	4		200	100	3.8	1.14	100	100	1.1	B5	PP
2P	642 300 000		2	22	250		40	7	100		7	B4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
R	112 311 100	D <sub>1</sub>	4				5		Rec		5mA	B7G	2T/270K
R	300 200 000	D <sub>1</sub>	2.5				5		D			UX4	2X2A
T	264 300 000		4	8	125		6.5	1.6	100		1.6	UX4	3A/107A
T	642 300 000		4	8	125		6.5	1.6	100		1.6	B4	3A/107B
T	264 300 000		2	1.5	125		0.9	0.5	100		0.5	UX4	3A/108A
T	642 300 000		2	1.5	125		0.9	0.5	100		0.5	B4	3A/108B
T	264 300 000		4	8	125		19	1.2	100		1.2	UX4	3A/109A
T	642 300 000		4	8	125		19	1.2	100		1.2	B4	3A/109B
RR	200 300 000	D <sub>1</sub> D <sub>2</sub>	2.5				120		Rec		30mA	UX4	3B23
R	030 000 200	D <sub>1</sub>	2.5				15		Rec		10mA	A08	3B26
T	642 310 000		6	20	400		60	10	100		8	B5	3B/252B
4NG	892 300 000		4				30		Rec		15mA	B4	RR
P	601 225 413		2.5	15	150	150	40		100	100		B9A	5A6
P	265 104 130		6	2	250	150	10	7.5	100	100	5	B8B	5A/152M
P	265 104 130		6	6	250	150	38	6.5	100	100	5	B8B	5B/110M

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
2S	289 130 000		2.5				15		REC		10mA	UX5	RR
2V3	020 000 300	D <sub>1</sub>	2.5				2		D			A08	R
2W3	020 800 030		2.5				60		REC		20mA	A08	R
2XP	642 300 000		2	36	300		50	7	100		7	B4	T
2X2	300 200 000	D <sub>1</sub>	2.5				5		D			UX4	R
2X3	020 800 030		2.5				120		REC		30mA	A08	R
2Y2	200 300 000	D <sub>1</sub>	2.5				5		D			UX4	R
2Z2	280 300 000		2.5				60		REC		20mA	UX4	R
3	642 300 000		2	7.5	150		3.4	0.9	100		0.9	B4	T
3A4	365 426 300		1.4	8.4	150	90	13.3	1.9	100	75	1.9	B7G	P
3A5	264 347 200		1.4	2.5	90		3.7	1.8	80		1.8	B7G	TT
3A8	237 546 380	G <sub>1</sub>	1.4	0	90		1.5	0.325	80		0.32		
3B5	036 540 320		1.4	7	75	75	0.2		80	60		A08	DTP
3B7	364 204 730		1.4	0	90		6.7	1.5	80	60	1.5	A08	P
3B21	289 300 000		2.5				5.2	1.85	80		1.85	B8B	TT
3B22	289 300 000		2.5				120		REC		30mA	UX4	RR
3B24	320 200 000	D <sub>1</sub>	2.5				30		REC		15mA	UX4	R
3B25	200 300 000	D <sub>1</sub>	2.5				120		REC		15mA	UX4	R
3B28	300 200 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
3C5	036 540 320		1.4	9	90	90	6	1.4	80	75	1.4	A08	P
3C6	206 447 320		1.4	0	90		4.5	1.3	80		1.3	A08	TT
3D6	365 004 230		1.4	4.5	150	90	10.2	2.4	100	75	2.4	B8B	P
3E6	265 134 020		1.4	0	90	90	2.5	1.8	80	90	1.8	A08	P
3LE4	365 004 230		1.4	9	90	90	1.8	1.6	80	75	1.6	A08	P
3LF4	365 004 230		1.4	4.5	90	90	8	2	80	75	2	B8B	P
3Q4	364 526 300		1.4	5	90	90	6.9	1.975	80	75	1.9	B7G	P
3Q5	036 540 320		1.4	4.6	90	90	8	2	80	75	2	A08	P
3S4	364 526 300		1.4	7	90	75	7.4	1.574	80	60	1.5	B7G	P
3V4	365 024 300		1.4	4.5	90	90	7.7	2	80	75	2	B7G	P
4	642 300 000		2	1	150		1	0.9	150		0.9	B4	T
4A6G	026 447 230		2	1.5	90		1.2	0.9	80		0.9	A08	TT
4C1	264 300 000		3	3	90		5	1	80		1	UX4	T
4D1	000 231 600	G <sub>1</sub>	13	3	250		10	4	150		4	B7	T
4S	289 130 000		2.5						D			UX5	D
4THA	645 231 700	G <sub>1</sub>	4	2	100	100	1.5		100			B7	TH
4TP	446 231 500	A <sub>2</sub>	4	5	150	150	16	4.5	150	100	4.5	B7	TP
4TPB	061 231 500	G <sub>1</sub>	4	3	250	150	12	8	100	100	7	B7	P
4TSP	041 231 500	A	4	3	250	150	12	8	100	100	7	B7	P
4XP	642 300 000		4	28.5	250		48	7	100		6	B4	T
4/100BU	892 300 000		4				120		REC		30mA	B4	RR
5AZ4	020 809 030		5				60		REC		20mA	B8B	RR
5E255	642 350 000		2	4.5	150	150	9.5	2.5	100	125	2.5	B5	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	036 540 320		1.4	4.6	90	90	4.5	2	80	75	2	A08	5Q5



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
5E415	642 350 000		4	25	300	200	20	1.7	100	PenLF	1.7	B5	P
5R4	020 809 030		5				60		REC		20mA	A08	RR
5R4GY	030 809 020		5				60		REC		20mA	A08	RR
5T4	020 809 030		5				120		REC		30mA	A08	RR
5U4	020 809 030		5				120		REC		30mA	A08	RR
5V4	030 809 020		5				60		REC		20mA	A08	RR
5W4	020 809 030		5				60		REC		20mA	A08	RR
5X3	289 300 000		5				15		REC		10mA	A08	RR
5X4	008 090 230		5				120		REC		30mA	A08	RR
5Y3GB	030 809 020		5				60		REC		20mA	A08	RR
5Y3GR	020 809 030		5				60		REC		20mA	A08	RR
5Y3GT	020 809 030		5				60		REC		20mA	A08	RR
5Y4	008 090 230		5				60		REC		20mA	A08	RR
5Y4SG	008 090 230		5				60		REC		20mA	A08	RR
5Z3	289 300 000		5				120		REC		30mA	UX4	RR
5Z4	030 809 020		5				60		REC		20mA	A08	RR
5Z4G	030 809 020		5				60		REC		20mA	A08	RR
6AB4	602 304 100		6	2	250		10	5.5	200		5.5	B7G	T
6AB7	021 415 360		6	3	300	200	12.5	5	100	150	5	A08	P
6AC5	026 040 310		6		250		32	3.4	100		3.4	A08	T
6AC7	021 415 360		6	2	300	150	10	9	100	100	8	A08	P
6AD5	026 040 310		6	2	250		0.9	1.5	200		1.5	A08	T
6AD7	427 546 310		6	25 16.5	250 250	250	4 34	0.325 2.5	100 100	PenLF	0.32 2.5	A08	TP
6AE5	026 040 310		6	15	100		7	1.2	80		1.2	A08	T
6AE6	026 740 310		6	1.5	250		6.5	1	200		1	A08	TT
6AE7	026 414 310		6	13.5	250		10	3	100		3	A08	TT
6AF5	026 040 310		6	18	175		7	1.5	100		1.5	A08	T
6AG5	412 365 100		6	1.5	250	150	7	5	100	100	5	B7G	P
6AG6	026 540 310		6	6	250	250	32	10	100	PenLF	9	A08	P
6AG7	120 415 360		6	3	300	150	30	11	100	100	10	A08	P
6AH5	520 604 310		6	18	350	250		5.2	100	PenLF	5	A08	P
6AH6	412 365 100		6	2	300	150	10	9	100	100	8	B7G	P
6AH7	417 146 230		6	9	250		12	2.4	100		2.4	A08	TT
6AJ5	412 365 100		6	1	30	30	2.7	2.5	No Data Available			B7G	P
6AJ7	021 415 360		6	2	300	300	10	9	150	150	7.5	A08	P
6AK5	412 365 100		6	2.3	150	150	7	4.3	100	100	4	B7G	P
6AK6	412 365 100		6	9	175	175	15	2.3	100	100	2.3	B7G	P
6AK7	120 415 360		6	3	300	150	30	11	100	100	9	A08	P
6AL5	192 310 800		6				5		D			B7G	RR
6AL6	020 540 310	A	6	14	250	250	72	6	100	PenLF	6	A08	P
6AM5	412 360 500		6	13.5	250	250	16	2.6	100	PenLF	2.6	B7G	P
6AM6	412 361 500		6	2	250	250	10	7.5	100	PenLF	6	B7G	P
6AN5	412 365 100		6	6	125	125	35	8	100	100	7	B7G	P
6AN6	289 ††1 300		6						D			B7G	DDDD

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	42I 060 350		6	22.5	250	150	55	5.8	100	100	5.8	A08	6AV5
R	00I 080 230		6				120		Rec		35mA	A08	6AX4
RR	029 080 310		6				60		Rec		20mA	A08	6AX5
P	412 365 100		6	1.3	250	150	7.5	5.7	100	125	5.7	B7G	6BC5
P	412 365 400		6	7.5	100	100	49	7.5	100	90	7	B7G	6BF5
P	04I 230 65I		6	3	250	100	2	1.225	100	100	1.2	B9A	6BR7
P	00I 230 65I	G <sub>1</sub>	6	3	250	100	2	1.25	100	100	1.2	B9A	6BS7
P	*4I 230 65I		6	13	300	225	34	3.75	100	150	3.7	B9A	6BW6

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
6AQ5	412 365 400		6	12.5	250	250	45	4	100	PenLF	4	B7G	P
6AQ6	412 398 600		6	3	250		1.0	1.2	150		1.2	B7G	DDT
6AQ7	918 461 230		6	2	250		2.3	1.6	100		1.6	A08	DDT
6AR5	412 365 000		6	16	250	250	34	2.4	100	PenLF	2.4	B7G	P
6AR6	106 052 430		6	36	300	300	58	4.3	100	PenLF	4.3	A08	P
6AR7	461 891 230		6	2	250		1.3	1.05	200		1.05	A08	DDT
6AS5	142 345 600		6	8.5	150	125	35	5.6	100	100	5	B7G	P
6AS6	412 365 100		6	2	125	125	5.5	3.5	100	100	3.5	B7G	P
6AS7	471 461 230		6	31.5	150		125	7.5	100		7	A08	TT
6AT6	412 389 600		6	3	250		1	1.2	150		1.2	B7G	DDT
6AU5	421 060 350		6	20	100	150	50	6	90	60	6	A08	P
6AU6	412 365 100		6	1	250	150	10.6	5.2	100	150	5.2	B7G	P
6AV6	412 389 600		6	2	250		1.2	1.6	200		1.6	B7G	DDT
6AW4	289 130 000		6				30		REC		15mA	UX5	RR
6AW5	208 190 310		6				30		REC		15mA	A08	RR
6AW6	412 365 100		6	1.8	250	150	7	5	100	125	5	B7G	P
6AY8	026 589 310	G <sub>1</sub>	6	5	250	100	52	9.5	100	90	9	A08	DDP
6A3	264 300 000		6	45	250		60	5.25	100		5	UX4	T
6A4	264 530 000		6	9	150	150	14	1.9	100	100	1.9	UX5	P
6A5	026 040 310		6	45	250		60	5.25	100		5	A08	T
6A6	274 146 300		6	5	250		6	3.1	100		3.1	UX7	TT
6A7	265 541 300	G <sub>1</sub>	6	2	250	100		1.15	100	100	1.15	Sm7	H
6A7E	265 541 300	G <sub>1</sub>	6	2	250	100		1.15	100	100	1.15	Sm7	H
6A7S	265 541 300	G <sub>1</sub>	6	2	250	100		1.15	100	100	1.15	Sm7	H
6A8	026 545 310	G <sub>1</sub>	6	8	250	100	3.5	1.15	100	100	1.15	A08	H
6BA6	412 365 100		6	1	250	100	11	4.4	100	100	4.4	B7G	P
6BA7	641 231 106		6	0	100		32	8	100		7	B9A	H
6BD6	412 365 100		6	3	250	100	9	2	100	100	2	B7G	P
6BE6	412 366 100		6	1	100		18	7.0	100		5	B7G	H
6BF6	412 398 600		6	9	250		9.5	1.9	100		1.9	B7G	DDT
6BG6	021 040 350	A	6	15	300	250	75	6	100	PenLF	5	A08	P
6BH6	412 365 100		6	1	250	150	7.4	4.6	100	PenLF	4.6	B7G	P
6BJ6	412 365 100		6	1	250	100	9.2	3.8	100	100	3.8	B7G	P
6BN6	142 354 600		6	1	60	60	0.25	1	80	60	1	B7G	P
6BN8	026 895 310	G <sub>1</sub>	6	3	250	125	9	1.13	100	100	1.1	A08	DDP
6BQ6	020 540 310	A	6	22.5	250	150	45	5.5	100	100	5	A08	P
6BY8	026 598 310	G <sub>1</sub>	6	4	250	250	44	12	100	PenLF	10	A08	DDP
6B4	026 040 300		6	45	250		60	5.25	100		5	A08	T
6B6	026 980 310	G <sub>1</sub>	6	2	250		0.9	1.1	100	100	1.1	A08	DDP
6B7	265 891 300	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.1	Sm7	DDP
6B7E	265 891 300	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.1	Sm7	DDP
6B7S	265 891 300	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.1	A7	DDP
6B8	026 985 310	G <sub>1</sub>	6	3	250	125	10	1.325	100	100	1.3	A08	DDP
6B8G	026 985 310	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.2	A08	DDP
6B8SG	026 985 310	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.2	A08	DDP

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	412 365 100	A	6	2.2	200	150	9.5	6.2	100	150	6	B7G	6CB6
P	021 040 350		6	30	175	175		7.5	100	100	7	A08	6CD6
P	*41 230 651		6	4.5	250	250	40	11	100	150	9	B9A	6CH6

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
6C4	602 364 100		6	8.5	250		10.5	2.2	100		3.1	B7G	T
6C5	026 040 310		6	8	250		8	2	100		2	A08	T
6C6	265 113 000	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	UX6	P
6C7	260 981 300	G <sub>1</sub>	6	9	250		4.5	1.25	100		1.2	A7	DDT
6C8	026 147 310	G <sub>1</sub>	6	4.5	250		3.2	1.6	100		1.6	A08	TT
6C9	276 454 130		6	{ 0 2.5	{ 100 250	{ 100	{ 5.0 3.0	{ 2.5	{ 80 100	{ 100	{ 3.1 2.5	{ B8A A08	{ TH TH
6C31	027 546 310	G <sub>1</sub>	6	{ 0 3	{ 100 250	{ 100	{ 5.0 3.0	{ 5.3 3.1	{ 100 100	{ 100	{ 5 3.1	{ A08	{ TH
6DR4	123 000 000	D <sub>1</sub>	6						D			B3G	D
6D1	123 000 000	D <sub>1</sub>	6						D			B3G	D
6D2	192 310 800		6				5		D			B7G	RR
6D5	026 040 310		6	40	275		31	2.1	100		2.1	A08	T
6D6	265 113 000	G <sub>1</sub>	6	3	250	100	8.2	1.6	100	100	1.6	UX6	P
6D7	265 101 300	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	A7	P
6D8	027 546 310	G <sub>1</sub>	6	{ — 3	{ 150 250	{ 100	{ 4.2 3.5	{ 150	{ 100 150	{ 100	{ 1.7	{ A08 UX7	{ H TT
6E6	274 146 300		6	27.5	250		18	1.7	100		1.7	UX7	TT
6E7	265 101 300	G <sub>1</sub>	6	3	250	100	8.2	1.6	100	100	1.6	A7	P
6E8G	027 546 310	G <sub>1</sub>	6	{ — —	{ 150 250	{ 100	{ 3.3 2.3	{ 2.8 100	{ 150 100	{ 100	{ 2.8	{ A08	{ TH
6F1	261 514 130		6	1.8	200	200	10	9	100	PenLF	8	B8A	P
6F5	020 600 310	G <sub>1</sub>	6	2	250		0.9	1.5	100		1.5	A08	T
6F6	026 540 310		6	16.5	250	250	34	2.5	100	PenLF	2.5	A08	P
6F7	275 641 300	G <sub>1</sub>	6	{ 3 3	{ 100 100	{ 100	{ 3.5 6.3	{ 0.5 1.05	{ 100 100	{ 100	{ 0.5 1.05	{ A7	{ TP
6F7B	275 641 300	G <sub>1</sub>	6	{ 3 3	{ 100 100	{ 100	{ 3.5 6.3	{ 0.5 1.05	{ 100 100	{ 100	{ 0.5 1.05	{ UX7	{ TP
6F7E	275 641 300	G <sub>1</sub>	6	{ 3 3	{ 100 100	{ 100	{ 3.5 6.3	{ 0.5 1.05	{ 100 100	{ 100	{ 0.5 1.05	{ UX7	{ TP
6F7M	023 756 410	G <sub>1</sub>	6	{ 3 3	{ 100 100	{ 100	{ 3.5 6.3	{ 0.5 1.05	{ 100 100	{ 100	{ 0.5 1.05	{ A08	{ TP
6F8	027 146 310	G <sub>1</sub>	6	8	250		9	2.6	100		2.6	A08	TT
6F11	260 154 130		6	1.8	250	100	4.4	2.2	100	100	2.2	B8A	P
6F12	412 361 500		6	2	250	250	10	7.5	100	150	5	B7G	P
6F13	260 154 130		6	1.8	200	200	10	9	150	150	8	B8A	P
6F14	260 154 130		6	1.25	150	150	28	10.6	100	100	8	B8A	P
6F15	260 154 130		6	2.5	250	100	7	2.3	100	100	2.3	B8A	P
6F17	412 361 500		6	2	150	150	46	6	No Data Available			B7G	P
6F32	216 510 030	G <sub>1</sub>	6	4.5	200	200	5.1	3	100	150	3	M08	P
6F33	412 361 500		6	4	200	200	5.75	3.55	100	150	3.5	B7G	P
6G6	026 540 310		6	9	175	175	15	2.3	100	100	2.3	A08	P
6G7	026 985 310	G <sub>1</sub>	6	3	250	125	10	1.325	100	100	1.3	A08	DDP
6G8	026 985 310	G <sub>1</sub>	6	3	250	125	9	1.125	100	100	1.1	A08	DDP
6H4	020 800 310		6						D			A08	D
6H6	029 180 310								D			A08	DD

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

TT	274 164 130		6		200		10	2·8	100		2·8	B8A	6L1
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
6H8G	026 895 310	G <sub>1</sub>	6	2	250	125	8.5	2.4	100	100	2.4	A08	DDP
6H8MG	026 895 310	G <sub>1</sub>	6	2	250	125	6	1.8	100	100	1.8	A08	DDP
6J4	412 344 600		6		150		15	12	100		10	B7G	T
6J5	026 040 310		6	8	250		9	2.6	100		2.6	A08	T
6J6	762 344 100		6		100		8.5	5.3	100		5.3	B7G	TT
6J7	026 510 310	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	A08	P
6J8	027 546 310	G <sub>1</sub>	6	$\begin{cases} 3 \\ 3 \end{cases}$	$\begin{matrix} 150 \\ 250 \end{matrix}$	100	1.3	1.6	100	100	1.6	A08	TH
6K5	026 000 310	G <sub>1</sub>	6	3	250		1.1	1.4	200		1.4	A08	T
6K6	026 540 310		6	18	250	250	32	2.3	100	PenLF	2.3	A08	P
6K7	026 510 310	G <sub>1</sub>	6	3	250	125	10.5	1.65	100	100	1.6	A08	P
6K8	027 546 310	G <sub>1</sub>	6	$\begin{cases} 0 \\ 3 \end{cases}$	$\begin{matrix} 100 \\ 250 \end{matrix}$	100	2.5		100	100	3	A08	TH
6LD20	264 098 130		6	5.9	250		5	2.3	100		2.3	B8A	T
6LD21													
6L5G	026 040 310		6	9	250		8	1.9	100		1.9	A08	T
6L6	026 540 310		6	18	350	250	54	5.2	100	PenLF	5.2	A08	P
6L7	026 540 310	G <sub>1</sub>	6	3	250	100	5.3	1.1	100	100	1.1	A08	P
6L18	26* 0*4 130		6	13.3	250		12	5.5	100		5.5	B8A	T
6L19	274 164 130		6	1.8	200		5	3.1	150		3.1	B8A	P
6M6	026 540 310		6	6	250	250	36	9.5	100	PenLF	8	A08	P
6M7	026 510 310	G <sub>1</sub>	6	2.5	250	125	10.5	3.4	100	100	3.2	A08	P
6M7MG	026 510 310	G <sub>1</sub>	6	2.5	250	125	6	2	100	100	2	A08	P
6M8	137 546 280	G <sub>1</sub>	6	$\begin{cases} 1 \\ 3 \end{cases}$	$\begin{matrix} 100 \\ 100 \end{matrix}$	100	0.5	1.1	100		1.1		
6NK7	026 510 310	G <sub>1</sub>	6	2	250	100	8.5	1.9	100	100	1.9	A08	DTP
6N4	412 361 400		6	3	175		12	6	150		6	B7G	T
6N7	027 446 310		6	5	250		6	3.1	100		3.1	A08	TT
6PX6	026 540 310		6	6	250	250	35	9.2	100	PenLF	8	A08	P
6PZ8	026 589 310	G <sub>1</sub>	6	6	250	250	36	9.2	100	PenLF	8	A08	P
6P5	026 040 310		6	13.5	250		5	1.45	100		1.4	A08	T
6P6	215 413 000	A	6	80	250	150	34		100	100		UX6	TP
6P7	023 756 410	G <sub>1</sub>	6	$\begin{cases} 3 \\ 3 \end{cases}$	$\begin{matrix} 100 \\ 100 \end{matrix}$	100	3.5	0.5	100		0.5		
							6.3	1.05	100	100	1.05	A08	TP
6P8	027 546 310	G <sub>1</sub>	6	$\begin{cases} - \\ 2.4 \end{cases}$	$\begin{matrix} 100 \\ 250 \end{matrix}$	75	2.2		100			A08	H
6P25	026 540 310		6	8.5	250	250	40	8.8	100	PenLF	8	A08	P
6P26	026 540 310		6	8.5	250	250	40	8.8	100	PenLF	8	A08	P
6P28	020 540 310	A	6	8.8	100	250	72	9.5	100	PenLF	9	A08	P
6Q6	026 080 310		6	3	250		1.2	1.05	150		1.05	A08	DT
6Q7	026 980 310	G <sub>1</sub>	6	3	250		1	1.2	150		1.2	A08	DDT
6R	026 510 310	G <sub>1</sub>	6	2	250	100			100	100		A08	P
6RV	026 510 310	G <sub>1</sub>	6	2	250	100	6.4	2.1	100	100	2.1	A08	P
6R6	026 500 310	G <sub>1</sub>	6	3	250	100	7	1.45	100	100	1.4	A08	P
6R7	026 980 310	G <sub>1</sub>	6	9	250		9.5	1.9	100		1.9	A08	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

T	*I* 234 **6		6	8	250		26	4.5	100		4.5	B9A	6S4
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R	001 080 230		6				120		Rec		30mA	A08	6U4
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
6SA7	126 641 310		6	0	100			4.5	100		4.5	A08	T
6SA7G	026 641 340		6	0	100			4.5	100		4.5	A08	T
6SB7Y	126 541 340		6	1	250	100	3.8		100	100		A08	P
6SC5	026 400 310		6	4	250		7.5	2.7	100		2.7	A08	T
6SC7	074 461 230		6	2	250		2	1.325	200		1.3	A08	TT
6SD7	021 415 360		6	2	250	100	6	3.6	100	100	3.6	A08	P
6SE7	021 415 360		6	1.5	250	100	4.5	3.4	100	100	3.4	A08	P
6SF5	014 060 320		6	2	250		0.9	1.5	200		1.5	A08	T
6SF7	041 586 230		6	1	250	100	12.4	2.05	100	100	2	A08	DP
6SG7	021 415 360		6	1	250	125	11.8	4.7	100	125	4.7	A08	P
6SH7	021 415 360		6	1	250	150	10.8	4.9	100	150	4.9	A08	P
6SJ7	021 415 360		6	3	250	100	3	1.65	100	100	1.6	A08	P
6SK7	021 415 360		6	3	250	100	9.2	2	100	100	2	A08	P
6SL7	461 471 230		6	2	250		2.3	1.6	150		1.6	A08	TT
6SN7	461 471 230		6	8	250		9	2.6	100		2.6	A08	TT
6SQ7	041 896 230		6	2	250		0.9	1.1	200		1.1	A08	DDT
6SR7	041 986 230		6	9	250		9.5	1.9	100		1.9	A08	DDT
6SS7	021 415 360		6	3	250	100	9	1.85	100	100	1.8	A08	P
6ST7	041 896 230		6	9	250		9.5	1.9	100		1.9	A08	DDT
6SU7	471 461 230		6	2	250		2.3	1.6	200		1.6	A08	TT
6SV7	041 586 230		6	1	250	150	7.5	3.4	100	150	3.4	A08	DP
6SZ7	041 986 230		6	3	250		1	1.2	200		1.2	A08	DDT
6S6	120 600 350	G <sub>1</sub>	6	2	250	100	13	4	100	100	4	A08	P
6S7	026 510 310	G <sub>1</sub>	6	3	250	100	8.5	1.75	100	100	1.7	A08	P
6S8	†18 916 230	G <sub>1</sub>	6	2	250		0.9	1.1	200		1.1	A08	DDDT
6T	205 413 000	A <sub>1</sub>	6	12.5	250	250	4.5	4.1	100	PenLF	4	UX6	P
6TE8	427 546 310	G <sub>1</sub>	6	2	100		3.7		100			A08	TH
				2	250	100	3.5		100	100			
6TH8	027 546 310	G <sub>1</sub>	6	1.5	150		6		150				
				1.5	300	75	3.5		100	75		A08	TH
6TP	205 413 000	A <sub>1</sub>	6	14.5	250	250	72	6	100	PenLF	6	UX6	P
6T6	026 500 310	G <sub>1</sub>	6	1	250	100	10	5.5	100	100	5.5	A08	P
6T7	026 980 310	G <sub>1</sub>	6	3	250		1.2	1.05	150		1.05	A08	DDT
6T8	†91 238 146		6	3	250		1	1.2	150		1.2	B9A	DDDT
6U6	026 540 310		6	14	200	150	56	6.2	100	100	6.2	A08	P
6U7	026 510 310	G <sub>1</sub>	6	3	250	100	8	1.5	100	100	1.5	A08	P
6V5	006 540 320		6	12.5	250	250	45	4.1	100	PenLF	4.1	A08	P
6V6	026 540 310		6	12.5	250	250	45	4.1	100	PenLF	4	A08	P
6V7	026 980 310	G <sub>1</sub>	6	20	250		8	1.1	100		1.1	A08	DDT
6W4	001 080 230		6				120		REC		30mA	A08	R
6W5	028 090 310		6				60		REC		20mA	A08	RR
6W6	026 540 310		6	9.5	150	150	58	9	100	100	8	A08	P
6W7	026 510 310		6	3	250	100	2	1.225	100	100	1.2	A08	P
6X3	020 000 310	D <sub>1</sub>	6				5		D			A08	R
6X4	802 309 100		6				30		REC		15mA	B7G	RR

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	265 004 130		6	9	125	125	44	6	100	90	6	B8B	7A5
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P	*41 230 651		6	4.5	250	250	40	11	100	150	9	B9A	7D10
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
6X5	028 090 310	D <sub>1</sub>	6				30		REC		15mA	A08	RR
6Y3	020 000 300		6				30		REC		15mA	A08	R
6Y5	208 193 000		6				30		REC		15mA	UX6	RR
6Y6	026 540 310		6	13.5	150	150	58	7	100	100	7	A08	P
6Y7	027 446 310		6	0	250		5.3		200			A08	TT
6ZY5	028 090 310		6				15		REC		15mA	A08	RR
6Z3	389 200 000		6				60		REC		20mA	UX4	RR
6Z4	289 130 000		6				30		REC		15mA	UX5	RR
6Z5	328 192 000		6				30		REC		15mA	UX6	RR
6Z6	028 190 310		6				30		REC		15mA	A08	RR
6Z7	026 447 310		6	0	175		4.2		175			A08	TT
7AB7	526 141 310		6	2	250	100	4	1.8	100	100	1.2	B8B	P
7AD7	265 104 130		6	2.3	300	150	28	9.5	100	150	9	B8B	P
7AF7	217 446 130		6	9	250		9	2.1	100		2.1	B8B	TT
7AG7	265 114 130		6	2	250	250	6	4.2	200	200	4.2	B8B	P
7AH7	265 114 130	S	6	2	250	250	6.8	3.3	100	150	3.3	B8B	P
7AJ7	265 104 130		6	3	250	100	2.2	1.575	100	100	1.5	B8B	P
7AK7	265 104 130		6	0	150	90	40	6.5	150	90	6	B8B	P
7A2	642 310 000		4	16.5	250	250	34	2.35	100	PenLF	2.3	B5	P
7A2	045 231 600		4	16.5	250	250	34	2.35	100	PenLF	2.3	B7	P
7A3	045 231 600	A	4	6	250	250	32	10	100	PenLF	9	B7	P
7A4	260 0*4 130		6	8	250		9	2.6	100		2.6	B8B	T
7A5	215 415 300		6	9	125	125	44	6	100	90	6	UX7	P
7A6	219 008 130		6				5		D			B8B	RR
7A7	265 104 130		6	3	250	100	9.2	2	100	100	2	B8B	P
7A8	266 451 130		6	0	200	100		1.6	100	100	1.6	B8B	P
7B4	260 004 130		6	2	250		0.9	1.5	200		1.5	B8B	T
7B5	265 004 130		6	18	250	250	32	2.3	100	PenLF	2.3	B8B	P
7B6	264 *89 130		6	2	250		0.9	1.1	200		1.1	B8B	DDT
7B7	265 104 130		6	3	250	100	8.5	1.75	100	100	1.7	B8B	P
7B8	265 454 130		6	2	250	100		1.15	100	100	1.1	B8B	P
7B8	265 454 130		6	2	250	100		1.15	100	100	1.1	B8B	P
7C4	200 800 130		6				5		D			A08	R
7C5	265 004 130		6	12.5	250	250	45	4.1	100	PenLF	4.1	B8B	P
7C5LT	265 004 130		6	12.5	250	250	45	4.1	100	PenLF	4.1	B8B	P
7C6	264 198 130		6	1	250		1.3	1	250		1	B8B	DDT
7C7	265 114 130		6	3	250	100	2	1.3	100	100	1.3	B8B	P
7D3	045 231 600		40	18	150	125	33	2.4	100		2.4	B7	P
7D5	045 231 600		13	16.5	250	250	34	2.35	100	PenLF	2.3	B7	P
7D6	045 231 600		40	6	250	250	32	10	100	PenLF	9	B7	P
7D8	045 231 600		13	6	250	250	32	10	100	PenLF	9	B7	P
7D9	412 360 500		6	13.5	250	250	16	2.6	100	PenLF	2.6	B7G	P
7D9	045 231 600		13	25	250	250	32	1.8	100	PenLF	1.8	B7	P
7E5	426 141 630		6	3	175		5.5	3	150		3	B8B	T
7E6	264 *98 130		6	8	250		9.5	1.9	100		1.9	B8B	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	001 230 651	G <sub>1</sub>	6	3	250	100	2	1·25	100	100	1·2	B9A	8D7
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
7E7	269 854 130		6	3	250	100	7.5	1.3	100	100	1.3	B8B	DDP
7F7	217 446 130		6	2	250		2.3	1.6	200		1.6	B8B	TT
7F8	427 116 340		6	3	250		6	3.3	200		3.3	B8B	TT
7G7	265 114 130		6	2	250	100	6	4.5	100	100	4.5	B8B	P
7G8	265 441 730		6	2.5	250	100	4.5	2.1	100	100	2.1	B8B	PP
7H6	265 114 130		6	2.5	250	150	9.5	3.5	100	150	3.5	B8B	P
7H7	265 114 130		6	2	250	150	10	4.2	100	150	4.2	B8B	P
7J7	276 454 130		6	{ 3 3	150 250	100	6.6 1.4	1.4	150 100		1.4	B8B	TH
7K7	216 498 130		6	2	250		2.3	1.6	200		1.6	B8B	DDT
7L7	265 104 130		6	1.5	250	100	4.5	3.1	100	100	3.1	B8B	P
7N7	217 446 130		6	8	250		9	2.6	100		2.6	B8B	TT
7Q7	266 414 130		6	0	100			4.5	100		4.5	B8B	T
7R1	280 300 000		7.5				60		REC		20mA	UX4	R
7R7	269 854 130		6	1	250	100	6.2	3.4	100	100	3.4	B8B	DDP
7S7	276 454 130		6	{ 0 2	100 250	100	6.5 1.8	1.65	100 100		1.65	B8B	TH
7T7	265 104 130		6	1	250	150	10.8	4.9	100	150	4.9	B8B	P
7V7	265 114 130		6	2	300	150	10	5.8	100	150	5.8	B8B	P
7W7	265 114 130		6	2	300	150	10	5.8	100	150	5.8	B8B	P
7X7	264 189 130		6	1	250		1.9	1.5	250		1.5	B8B	DDT
7Y4	208 009 130		6				30		REC		15mA	B8B	RR
7Z4	209 008 130		6				60		REC		20mA	B8B	RR
8A1	041 231 500	A	4	1.5	200	75	3.5	4	100	75	4	B7	P
8A1	542 310 000	A	4	1.5	200	75	3.5	4	100	75	4	B5	P
8A2	542 310 000	A	4	2.1	200	100	3	2.4	100	100	2.4	B5	P
8D2	061 231 500	G <sub>1</sub>	13	3	250	100	2	1.25	100	100	1.25	B7	P
8D3	412 361 500		6	2	250	250	10	7.5	100	150	5	B7G	P
8D4	026 510 310	G <sub>1</sub>	6	2	250	100	3	1.8	100	100	1.8	A08	P
8D5	041 230 651		6	3	250	100	2	1.225	100	100	1.2	B9A	P
8D6	141 230 651		6										
9A1	045 231 500	A	4	1.5	200	75	5	4.25	100	75	4.2	B7	P
9A1	542 310 000	A	4	1.5	200	75	5	4.25	100	75	4.2	B5	P
9A3	061 231 500	G <sub>1</sub>	4	2	250	125	10	1.8	100	100	1.8	B7	P
9D2	061 231 500	G <sub>1</sub>	13	3	250	125	10.5	1.65	100	100	1.8	B7	P
9D6	412 361 500		6	2.5	250	200	8	2.5	100	100	2.5	B7G	P
10	264 300 000		7.5	32	350		16	1.55	100		1.55	UX4	T
10C1	276 454 130		28	{ 3.5 2.5	100 175	100	6	3.5	100 100		4	B8A	TH
10D1	892 310 000		13				5		D	100		B5	RR
10F1	261 514 130		22	1.8	200	200	10	9	100	150	7	B8A	P
10F3	260 154 130		22	1.65	200	200		9	100	150	7	B8A	P
10F9	260 154 130		13	2.5	175	100	7	2.3	100	100	2.3	B8A	P
10LD11	264 098 130		15	5.9	250		5	2.3	100		2.3	B8A	DDT
10PI3	26* *54 130		40	6.3	175	150	29	7.5	100	100	6	B8A	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

TT	741 226 413		6	10.5	250		11.5	3.1	100		4	B9A	12BH7
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
I0P14	026 540 310		40	11	200	200	40	7.4	100	PenLF	6	A08	P
I1	362 400 000		1.1	4.5	90		2.5	0.425	80		0.4	UX4	T
I1A2	908 231 600	G <sub>1</sub>	4	2	200		3	2.8	150		2.8	B7	DDT
I1D3	908 231 600	G <sub>1</sub>	13	2	250		0.4	1.1	200		1.1	B7	DDT
I1D5	908 231 600	G <sub>1</sub>	13	3	250		3.8	1.5	150		1.5	B7	DDT
I1E1	216 540 030		6		250	250	50	7.3	100	100		M08	P
I1E2	020 540 310	A	6		200	200	25	9	100	150	8	A08	P
I1E8	200 647 310	G <sub>1</sub>	11		150		20		100			A08	TT
I1X5	028 090 310		11				30		REC		15mA	A08	RR
I2	364 200 000		1.1	4.5	90		2.5	0.425	80		0.4	UX4	T
I2AH7	417 146 230		12.5	3.6	100		3.7	1.55	80		1.55	A08	TT
I2AL5	192 310 800		12.5				5		D			B7G	RR
I2AT6	412 389 600		12.5	3	250		1	1.2	200		1.2	B7G	DDT
I2AT7	741 226 413		6	2	250		10	5.5	200		5	B9A	TT
I2AU6	412 365 100		12.5	1	250	150	10.8	5.2	100	100	5.2	B7G	P
I2AU7	741 226 413		6	8.5	250		10.5	2.2	100		2.2	B9A	TT
I2AV6	412 389 600		12.5	2	250		1.2	1.6	150		1.6	B7G	DDT
I2AW6	412 365 100		12.5	1.5	250	150	7	5	100	PenLF	5	B7G	P
I2AW7	412 365 100		12.5	1.8	250	150	7	5	100	150	5	B7G	P
I2AX7	741 226 413		6	2	250		1.2	1.6	150		1.6	B9A	TT
I2AY7	641 227 413		6	4	250		3	1.75	100		1.7	B9A	TT
I2A	264 300 000		5	4.5	90		5	1.5	80		1.5	UX4	T
I2A5	265 413 200		6	15	100	100	17	1.7	100	90	1.7	UX7	P
I2A6	026 540 310		12.5	12.5	250	250	30	3	100	PenLF	3	A08	P
I2A7	265 181 300	G <sub>1</sub>	12.5	12.5	150	150	30 9	REC 0.975	100	100	15mA 0.9	Sm7	RP
I2A8	026 545 310	G <sub>1</sub>	12.5	2	250	100		1.15	100	100	1.1	A08	P
I2BA6	412 365 100		12.5	1	250	100	11	4.4	100	100	4.4	B7G	P
I2BA7	641 231 106		12.5	0	100		32	8	100		7	B9A	H
I2BD6	412 365 100		12.5	3	250	100	9	2	100	100	2	B7G	P
I2BE6	412 365 400		12.5	1.5	250	100	3		100	100		B7G	P
I2BF6	412 398 600		12.5	9	250		9.5	1.9	100		1.9	B7G	DDT
I2BN6	142 354 600		12.5	1	60	60	0.25	1	80	60	1	B7G	P
I2B6	026 080 310	G <sub>1</sub>	12.5	2	250		0.9	1.1	150		1.1	A08	DT
I2B7	265 104 130		12.5	3	250	100	9.2	2	100	100	2	B8B	P
I2B8	127 561 340	G <sub>1</sub>	12.5	0 3	90 90	90	2.8 7	2.4 1.8	80 80	90	2.4 1.8	A08	TP
I2C8	026 985 310	G <sub>1</sub>	12.5	3	250	125	10	1.325	100	100	1.3	A08	DDP
I2E1	020 540 310	A	6	18	150	150	100	9.6	100	100	10	A08	P
I2E5	026 040 310		12.5	13.5	250		5	1.45	100		1.4	A08	T
I2F5	020 600 310	G <sub>1</sub>	12.5	2	250		0.9	1.5	150		1.5	A08	T
I2G7	026 980 310	G <sub>1</sub>	12.5	3	250			1.2	150		1.2	A08	DDT
I2H6	029 180 310		12.5						D			A08	DD
I2J5	026 040 310		12.5	8	250		9	2.6	100		2.6	A08	T
I2J7	026 510 310	G <sub>1</sub>	12.5	3	250	100	2	1.225	100	100	1.2	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	021 415 360		12.5	3	250	100	9	1.35	100	100	1.8	A08	12SS7
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R	210 300 000	D <sub>1</sub>	12.5				60		Rec	20mA		UX4	12X3
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RR	298 300 000		5				60		Rec	20mA		UX4	13
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	061 231 500	G <sub>1</sub>	13	3	200	100	7	1.8	100	100	1.8	B7	13VPA
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
12K7	026 510 310	G <sub>1</sub>	12·5	3	250	125	10·5	1·65	100	100	1·6	A08	P
12K8	027 546 310	G <sub>1</sub>	12·5	0	100			3	100		3	A08	TH
12L8	414 752 360		12·5	3	250	100	2·5		100	100			
12NK7	026 510 310	G <sub>1</sub>	12·5	9	175	175	13	2·15	100	100	2·1	A08	PP
12Q7	026 980 310	G <sub>1</sub>	12·5	2	250	100	5	2·3	100	100	2·3	A08	P
			12·5	3	250		1	1·2	150		1·2	A08	DDT
12SA7	126 641 340		12·5	0	100			4·5	100		4·5	A08	T
12SA7G	026 641 340		12·5	0	100			4·5	100		4·5	A08	T
12SC7	074 461 230		12·5	2	250		2	1·325	150		1·3	A08	TT
12SF5	014 060 310		12·5	2	250		0·9	1·5	150		1·5	A08	T
12SF7	041 586 230		12·5	1	250	100	12·9	2·05	100	100	2	A08	DP
12SG7	021 415 360		12·5	1	250	125	11·8	4·7	100	100	4·7	A08	P
12SH7	021 415 360		12·5	1	250	150	10·8	4·9	100	150	4·9	A08	P
12SJ7	021 415 360		12·5	3	250	100	3	1·65	100	100	1·6	A08	P
12SK7	021 415 360		12·5	3	250	100	9·2	2	100	100	2	A08	P
12SL7	461 471 230		12·5	2	250		2·3	1·6	150		1·6	A08	TT
12SN7	461 471 230		12·5	8	250		9	2·6	100		2·6	A08	TT
12SQ7	041 896 230		12·5	2	250		0·9	1·1	150		1·1	A08	DDT
12SR7	041 986 230		12·5	9	250		9·5	1·9	100		1·9	A08	DDT
12SW7	041 986 230		12·5	9	250		9·5	1·9	100		1·9	A08	DDT
12SX7	471 461 230		12·5	8	250		9	2·6	100		2·6	A08	TT
12SY7	126 641 340		12·5	0	100		27	4·5	100		4·5	A08	H
12S8	†18 916 230	G <sub>1</sub>	12·5	2	250		0·9	1·1	150		1·1	A08	DDDT
12Z3	281 300 000		12·5				60		REC		20mA	UX4	R
12Z5	281 319 200		6				30		REC		15mA	UX7	RR
13BCIU	206 081 930	G <sub>1</sub>	12·5	1·8	200		3	2	150		2	B8B	DDT
13BF2U	206 581 930	G <sub>1</sub>	12·5	2·1	200	200	5	2	100	200	2	B8B	DDP
13DHA	908 231 600	G <sub>1</sub>	13	1·5	250		1	1·5	150		1·5	B7	DDT
13F9U	206 501 130	G <sub>1</sub>	12·5	2·6	200	200	6·2	2·2	100	200	2·2	B8B	P
13HI	023 110 560	G <sub>1</sub>	13	2	200	100	3	2	100	100	2	8SC	P
13H2	023 110 560	G <sub>1</sub>	13	3	200	100	8·2	1·8	100	100	1·8	8SC	P
13PGA	645 231 700	G <sub>1</sub>	13	20	200		4		100				
13SPA	061 231 500	G <sub>1</sub>	13	3	250	100	3·5		100	100		B7	H
13V1	023 189 560	G <sub>1</sub>	13	8·5	200	200	45	1·25	100	100	1·25	B7	P
13VPA	041 231 500	A	13	3	200	100	7	4·4	100	PenLF	4	8SC	DDT
14	265 130 000	G <sub>1</sub>	14	3	250	90	4	1·8	100	100	1·8	B7	P
								1·05	100	90	1	UX5	P
14AF7	216 447 130		12·5	9	250		9	2·1	100		2·1	B8B	TT
14A4	260 0*4 130		12·5	8	250		9	2·6	100		2·6	B8B	T
14A5	265 004 130		12·5	12·5	250	250	30	3	100	PenLF	3	B8B	P
14A7	265 104 130		12·5	3	250	100	9·2	2	100	100	2	B8B	P
14B6	264 *89 130		12·5	2	250		0·9	1·1	150		1·1	B8B	DDT
14B8	265 454 130		12·5	2	250	100		1·15	100	100	1·1	B8B	P
14C5	265 004 130		12·5	15	250	250	70		100	PenLF		B8B	P
14C7	265 114 130		12·5	3	250	100	2·2	1·575	100	100	1·5	B8B	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

R	020 000 300	D <sub>1</sub>	4				30		Rec	17mA	A08	19G3
R	112 311 100	D <sub>1</sub>	4				30		Rec	15mA	B7G	19G6
R	002 300 000	D <sub>1</sub>	4				60		Rec	23mA	B4	19H1
R	020 000 300	D <sub>1</sub>	2.5				30		Rec	13mA	A08	19H4

RR	182 310 900		9.5				5		D		B7G	20D1
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TT	274 164 130		12.5		200		10	2.8	100		2.8	B8A	20L1
P	020 540 310	A	38	7.5	225	225		13.5	100	100	10	A08	20P2

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
14E6	264 *98 130		12.5	8	250		9.2	1.9	100		1.9	B8B	DDT
14E7	269 854 130		12.5	3	250	100	7.5	1.3	100	100	1.3	B8B	DDP
14F7	217 446 130		12.5	2	250		2.3	1.6	150		1.6	B8B	TT
14F8	427 116 340		12.5	3	250		6	3.3	150		3.3	B8B	TT
14H7	265 114 130		12.5	2	250	150	10	4.2	100	100	4.2	B8B	P
14J7	276 454 130		12.5	{ 3 3	150 250	100	6.6 1.4	1.4	100 100	100	1.4	B8B	TH
14N7	217 446 130		12.5	8	250		9	2.6	100		2.6	B8B	TT
14Q7	266 414 430		12.5	0	100			4.5	100		4.5	B8B	T
14R7	269 854 130		12.5	1	250	100	6.2	3.4	100	100	3.4	B8B	DDP
14S7	276 454 130		12.5	{ 0 2	100 250	100	6.5 1.8	1.65	100 100	100	1.6	B8B	TH
14V7	265 104 130		12.5	2	300	150	9.6	5.8	100	100	5.8	B8B	P
14W7	265 114 130		12.5	2.2	300	150	10	5.8	100	100	5.8	B8B	P
14X7	264 189 130		12.5	1	250		1.9	1.5	150		1.5	B8B	DDT
14Y4	208 009 130		12.5				30		REC		15mA	B8B	RR
14Z3	281 300 000		12.5				60		REC		20mA	UX4	R
15	265 130 000	G <sub>1</sub>	2	1.5	150	75	1.85	0.75	100	75	0.75	UX5	P
15A2	645 231 700	G <sub>1</sub>	4	{ 20 3	200 250	100	4 3.5		100 100	100		B7	H
15D1	645 231 700	G <sub>1</sub>	13	{ 20 3	200 250	100	4 3.5		100 100	100		B7	H
15D2	645 231 700	G <sub>1</sub>	13	{ 20 3	200 250	100	4 3.5		100 100	100		B7	H
15X6	029 180 310		25				30		REC		15mA	A08	RR
16D1	046 231 700		13		300		45		100			B7	TT
17	264 130 000		14	6	90		2.7	0.8	80		0.8	UX5	T
18	265 413 000		14	16.5	250	250	34	2.5	100	PenLF	2.5	UX6	P
19BG6	021 040 350	A	19	15	400	250	70	6	100	PenLF	6	A08	P
19J6	762 344 100		19	1	100		8.5	5.3	100		5.3	B7G	TT
19T8	†91 238 146		19	3	250		1	1.2	150		1.2	B9A	DDDT
19	364 472 000		2	3	150		1.7		100			UX6	TT
20	364 200 000		3	16.5	90		3	0.415	80		0.4	UX4	T
20A1	645 231 700	G <sub>1</sub>	4	{ 12.5 1.5	100 250	75	2.3 2.2		100 100	75		B7	H
20D2	745 231 600	G <sub>1</sub>	13	{ 7.5 3	100 250	100	3.8 2.5		100 100	100		B7	H
20D3	541 227 463		6	{ 0 3	100 250	100		3.6	100 100	75	3.6	B9A	TH
20F2	260 154 130		11	1.25	150	150		10.6	100	100	9		B8A
20J8	027 546 310	G <sub>1</sub>	20	{ 1.5 3	100 250	100	1.5 1.5		100 100	100		A08	H
20P1	020 540 310	A	38	30	200	200	80	6	100	100	5	A08	P
21A7	276 454 130		21	{ — 3	150 250	100	3.5 1.3			100	100	B8B	TH
22	365 200 000	G <sub>1</sub>	3	1.5	150	50	1.7	0.375	No Data Available			UX4	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	42I 060 350		25	22.5	250	150	55	5.8	100	100	5.8	A08	25AV5
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RR	028 190 310		25				60		Rec	20mA		A08	25V5
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
22AC	265 300 000	G <sub>1</sub>	2.5	3	90	90	4	1.05	80	90	1	UX4	P
24A	265 130 000	G <sub>1</sub>	2.5	3	175	90	4	1	100	90	1	UX5	P
24E	265 130 000	G <sub>1</sub>	2.5	3	175	90	4	1	100	90	1	UX5	P
24NG	281 193 000		40				30		REC		15mA	UX6	RR
24S	265 130 000	G <sub>1</sub>	2.5	3	175	90	4	1	100	90	1	UX5	P
25	542 300 000	A	2		150	75	2.5	1	100	75	1	B5	P
25AC1D	206 008 030	G <sub>1</sub>	1.4	0	125		0.76	0.4	100		0.4	A08	DT
25AC5	026 040 310		25		125		45	3.8	100		3.8	A08	T
25A6	026 540 310		25	18	150	125	33	2.375	100	100	2.3	A08	P
25A7	126 548 310		25	{ 15	100	100	60	20.5	REC		20mA	A08	RP
								1.8	100	90	1.8		
25BQ6	020 540 310	A	25	22.5	250	150	45	5.5	100	100	5	A08	P
25B6	026 540 310		25	22	150	150	61	5	100	100	5	A08	P
25B8	127 561 340	G <sub>1</sub>	25	{ 1	100		0.6	1.5	100		1.5	A08	TP
				{ 3	100	100	7.6	2	100	100	2		
25C6	026 540 310		25	14	200	150	61	7.1	100	100	7	A08	P
25D8	127 546 380	G <sub>1</sub>	25	{ 1	100		0.5	1.1	100		1.1		
				{ 3	100	100	8.5	1.9	100	100	1.9	A08D	TP
25FID	206 501 030	G <sub>1</sub>	1.4	2.5	125	125	1.2	0.72	100	100	0.7	A08	P
25L6	026 540 310		25	8	200	100	50	9.5	100	90	8	A08	P
25RE	281 193 000		25				30		REC		15mA	UX6	RR
25SN7	461 471 230		25	8	250		9	2.6	100		2.5	A08	TT
25S	268 943 000		2	3	150		0.8	0.57	100		0.57	UX6	DDT
25W9	001 080 230		25				120		REC		30mA	A08	R
25X5	020 080 310		25				120		REC		30mA	A08	R
25X6	028 190 310		25				30		REC		15mA	A08	RR
25Y4	020 080 310		25				60		REC		20mA	A08	R
25Y5	281 193 000		25				60		REC		20mA	UX6	RR
25Y5G	028 190 310		25				60		REC		20mA	A08	RR
25Y6	028 190 310		25				30		REC		15mA	A08	RR
25Z3	281 300 000		25				60		REC		20mA	UX4	R
25Z4	028 080 310		25				120		REC		30mA	A08	R
25Z5	291 183 000		25				60		REC		20mA	UX6	RR
25Z6	029 180 310		25				60		REC		20mA	A08	RR
26	264 300 310		1.5	10	150	100	5.5	1.1	100		1.1	UX4	T
26A6	412 365 100		26	1.8	250	250	10.5	4	100	100	4	B7G	P
26A7	414 752 360		26	4.5	30	30	20	5.5	No Data Available			A08	PP
26B6	026 540 310		35	18	250	125	33	2.375	100	90	2.3	A08	TT
26C6	412 398 600		26	9	250		9.5	1.9	100		1.9	B7G	DDT
26D6	412 365 100		26	0	100	100	2.7	7.2	100	100	6	B7G	H
26NG	281 193 000		40				30		REC		15mA	UX6	RR
27	264 130 000		2.5	21	250		5.2	0.95	100		0.95	UX5	T
27S	264 130 000		2.5	21	250		5.2	0.95	100		0.95	UX5	T
27SU	320 080 210		13				120		REC		30mA	A08	R
28D7	245 671 430		28	3.5	30	30	12.5	3.4	No Data Available			B8B	PP

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
D	220 283 330		4						D			A08	29C1
TT	204 140 300	A <sub>1</sub> A <sub>2</sub>	6	7	250		15	3	100		3	UX7	33A/138A
P	026 540 310		6	18	250	250	32	2·3	100	PenLF	2·3	A08	41M

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
28Z5	208 009 130		28				60		REC		20mA	B8B	RR
29	264 413 000		2.5	3	175		4.5	1.45	100		1.4	UX6	T
30	364 200 000		2	9	150		3	0.9	100		0.9	UX4	T
31	364 200 000		2	22.5	150		8	0.925	100		0.9	UX4	T
32	365 200 000	G <sub>1</sub>	2	3	150	75	1.7	0.64	100	75	0.6	UX4	P
32E	365 200 000	G <sub>1</sub>	2	3	150	75	1.7	0.64	100	75	0.6	UX4	P
32L7	126 548 310		32.5	{ 5	90	90	60		REC		20mA	A08	RP
33	364 520 000		2		14	150	150	38	6	80	75		
34	365 200 000	G <sub>1</sub>	2	3	150	75	2.8	0.6	100	75	0.6	UX4	P
34E	365 200 000	G <sub>1</sub>	2	3	150	75	2.8	0.6	100	75	0.6	UX4	P
35	265 130 000	G <sub>1</sub>	2.5	3	250	90	6.5	1.05	100	75	1.05	UX5	P
35A5	265 004 130		35	8	200	100	41	5.9	100	90	5.9	B8B	P
35B5	412 365 400		35	7.5	125	100	40	5.8	100	90	5.8	B7G	P
35C5	142 345 600		35	7.5	125	100	40	5.8	100	90	5.8	B7G	P
35L6	026 540 310		35	7.5	200	100	40	5.8	100	90	5.8	A08	P
35RE	281 193 000		35				60		REC		20mA	UX6	R
35S	265 130 000	G <sub>1</sub>	2.5	3	250	90	6.5	1.08	100	90	1.08	UX5	P
35W4	003 282 100		30				60		REC		20mA	B7G	R
35Y4	280 200 130		27.5				60		REC		20mA	B8B	R
35Y5	280 200 130		27.5				60		REC		20mA	B8B	R
35Z3	280 000 130		35				120		REC		30mA	B8B	R
35Z3LT	280 000 130		35				120		REC		30mA	B8B	R
35Z4	020 080 310		35				120		REC		30mA	A08	R
35Z4GT	020 080 310		35				120		REC		30mA	A08	R
35Z5	022 080 310		27.5				60		REC		20mA	A08	R
35Z6	028 190 310		35				60		REC		30mA	A08	RR
36	265 130 000	G <sub>1</sub>	6	3	250	90	3.2	1.08	100	90	1.08	UX5	P
37	264 130 000		6	18	250		7.5	1.1	100		1.1	UX5	T
38	265 130 000	G <sub>1</sub>	6	18	175	175	14	1.05	100	100	1.05	UX5	P
39	265 130 000	G <sub>1</sub>	6	3	175	90	5.8	1	100	90	1	UX5	P
40	364 200 000		5	1.5	175		0.2	0.2	150		0.2	UX4	T
40PPA	045 231 600		40	25	150	150	36	4	100	100	4	B7	P
40SUA	802 310 000		40				60		REC		20mA	B5	R
40Z5	022 080 310		35				120		REC		30mA	A08	R
41	265 413 000		6	18	250	250	32	2.3	100	100	2.3	UX6	P
41E	265 413 000		6	18	250	250	32	2.3	100	100	2.3	UX6	P
41FP	642 310 000		4	18	250		19	2.8	100		2.8	B5	T
41MDG	652 310 000	G <sub>1</sub>	4	0	150	100		0.25	150	100	0.25	B5	P
41MH	642 310 000		4	1.5	200		3.2	4	150		4	B5	T
41MHF	642 310 000		4	2	150		2.5	2.8	125		2.8	B5	T
41MHL	642 310 000		4	3	200		4	4.5	150		4.5	B5	T
41MLF	642 310 000		4	4.5	175		7.5	1.9	125		1.9	B5	T
41MP	642 310 000		4	7.5	200		24	7.5	100		7	B5	T
41MPG	645 231 700	G <sub>1</sub>	4	1.5	250	100			100	100		B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	026 540 310		25	18	250	125	33	2.375	100	100	2.3	A08	43MG
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
41MPT	041 231 500	A	4	1-5	250	100	12	4-8	100	100	4-8	B7	P
41MRC	642 310 000		4	1	200		2-5	2-6	150		2-6	B5	P
41MSG	465 230 574		4	1-5	125	60	0-8	2-5	100	60	2-5	B9	PP
41MTA	642 310 000		4	1	100		4-9	4	100		4	B5	T
41MTB	642 310 000		4	1	100		3-6	2-6	100		2-6	B5	T
41MTL	642 310 000		4	2-5	200		5-9	3	100		3	B5	T
41MTS	045 231 600	A <sub>2</sub>	4	1	250	100	5	1-6	100	100	1-6	B7	PP
41MVSG	542 310 000	A	4	1-5	200	100	3	2	100	100	2	B5	P
41MXP	642 310 000		4	12-5	200		40	7-5	100		7	B5	T
41STH	645 231 700	G <sub>1</sub>	4	1-5	200	60	1		100	60		B7	P
42	265 413 000		6	16-5	250	250	34	2-5	100	PenLF	2-5	UX6	P
42E	265 413 000		6	16-5	250	250	34	2-5	100	PenLF	2-5	UX6	P
42MP/Pen	045 231 600		4	5-5	250	250	32	7	100	PenLF	7	B7	P
42MPT	041 231 500	A	4	3	200	200	34	8-5	100	PenLF	8	B7	P
42/OT	045 231 600		4	5-5	250	275	34	7	100	PenLF	7	B7	P
42/OTDD	968 231 500	G <sub>1</sub>	4	5-5	250	250	34	7	100	PenLF	7	B7	P
42PTB	061 231 500	G <sub>1</sub>	4	3	200	200	34	8-5	100	150	8	B7	P
42SPT	041 231 500	A	4	10-5	250	250	64	11	100	PenLF	10	B7	P
43	265 413 000		25	18	150	125	33	2-375	100	100	2-3	UX6	P
43E	265 413 000		25	18	150	125	33	2-375	100	100	2-3	UX6	P
43IU	892 300 000		4				60		REC		20mA	B4	RR
44	265 130 000	G <sub>1</sub>	6	3	175	90	5-8	1	100	90	1	UX5	P
44IU	892 300 000		4				60		REC		20mA	B4	RR
45	264 300 000		2-5	50	250		34	2-175	100		2-1	UX4	T
45A	264 300 000		2-5	68	325		43	2-37	100		2-37	UX4	T
45IU	892 300 000		4				120		REC		30mA	B4	RR
45LIU	206 540 130		45	13	200	200	45	7-5	100	100	7	A08	P
45Z3	28* 108 300		45				60		REC		20mA	B7G	R
45Z5	022 080 310		37-5				60		REC		20mA	A08	R
46	264 430 000		2-5	33	250		22	2-35	100		2-3	UX5	T
47	264 530 000		2-5	16-5	250	250	31	2-5	100	PenLF	3-8	UX5	P
48	265 413 000		30	19	100	100	52	3-8	100	90	3-8	UX6	P
49	264 630 000		2	20	125		6	1-125	100		1-1	UX5	T
50	264 300 000		7-5	70	400		55	2-1	100		2-1	UX4	T
50A5	265 004 130		50	7-5	125	100	49	8	100	90	7	B8B	P
50BC1D	206 089 030	G <sub>1</sub>	1-4	1-5	100		1-5	0-92	100		0-92	A08	DDT
50B5	412 365 400		50	7-5	125	100	49	7-5	100	90	6	B7G	P
50C5	142 345 600		50	7-5	125	100	49	7-5	100	90	6	B7G	P
50C6	026 540 310		50	13-5	150	150	58	7	100	100	7	A08	P
50F2D	206 501 030	G <sub>1</sub>	1-4	1-5	100	125	1-4	1	100	100	1	A08	P
50L1D	206 540 030		1-4	4-5	100	125	4-8	1	100	100	1	A08	P
50L6	026 540 310		50	8	200	100	50	9-5	100	75	8	A08	P
50X6	219 008 130		50				60		REC		20mA	B8B	RR
50YIU	388 208 120		50				120		REC		30mA	A08	R
50Y6	029 180 310		50				60		REC		20mA	A08	RR

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	020 540 310	A	6	18	175	175	100	10	100	100	9	A08	62BT
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
50Y7	028 193 310		46				60		REC		20mA	A08	RR
50Z6	029 180 310		50				120		REC		30mA	A08	RR
50Z7	029 183 310		48				60		REC		20mA	A08	RR
52	264 530 000		6	0	125	100	43	2	125	100	2	UX5	P
52KU	030 908 020		5				60		REC		20mA	A08	RR
53	274 146 300		2.5	5	250		6	3.1	100		3.1	UX7	TT
53KU	030 908 020		5				120		REC		30mA	A08	RR
54KU	030 908 020		5				120		REC		30mA	A08	RR
55	269 813 000	G <sub>1</sub>	2.5	20	250		8	1.1	100		1.1	UX6	DDT
56	264 130 000		2.5	13.5	250		5	1.45	100		1.45	UX5	T
56AS	264 130 000		6	13.5	250		5	1.45	100		1.45	UX5	T
57	265 113 000	G <sub>1</sub>	2.5	3	250	100	2	1.225	100	100	1.2	UX6	P
57AS	265 113 000	G <sub>1</sub>	6	3	250	100	2	1.22	100	100	1.2	UX6	P
58	265 113 000	G <sub>1</sub>	2.5	3	250	100	8	1.5	100	100	1.5	UX6	P
58AS	265 113 000	G <sub>1</sub>	6	3	250	100	8	1.5	100	100	1.5	UX6	P
59	265 411 300		2.5	18	250	250	35	2.5	100	PenLF	2.5	UX7	P
59B	265 410 300		2.5	26	250	250	26	6	100	PenLF	6	UX7	P
60/250	892 300 000		4				30		REC		15mA	B4	RR
61BT	020 540 310	A	6	20	200	200	40	4	100	100	4	A08	P
61SPT	520 604 310		6	10.5	250	250	64	11	100	PenLF	9	A08	P
61SPT	021 540 310	A	6	10.5	250	250	64	11	100	PenLF	9	A08	P
63SPT	256 101 403		6	2	250	250	10	6.5	100	PenLF	6	B9G	P
64	265 130 000	G <sub>1</sub>	6	3	175	90	3.1	1.05	100	90	1.05	UX5	P
65	265 130 000	G <sub>1</sub>	6	3	175	90	4.5	1	100	90	1	UX5	P
67	264 130 000		6	9	150		5	1.1	100		1.1	UX5	T
68	265 130 000	G <sub>1</sub>	6	13.5	150	90	14	1.4	100	75	1.4	UX5	P
69	264 413 000		6	3	175		4.5	1.45	150		0.5	UX6	P
70	264 413 000		6	6	175		2.3	0.5	150		0.5	UX6	P
70A7	126 548 310		70	7.5	125	100	40	5.8	100	90	5.8	A08	RP
70L7	126 541 380		70	7.5	125	100	60		REC		20mA	A08	RP
							40	7.5	100	90	6.5		
71	264 300 000		5	40	175		20	1.7	100		1.7	UX4	T
71A	264 300 000		5	16.5	90		10	1.4	80		1.4	UX4	T
71B	264 300 000		5	40	175		20	1.7	100		1.7	UX4	T
72	300 200 000	D <sub>1</sub>	2.5				30		REC		15mA	UX4	R
73	*2* 0** 3*0	D <sub>1</sub>	2.5				15		REC		10mA	A08	R
75	269 813 000	G <sub>1</sub>	6	2	250		0.9	1.1	150		1.1	UX6	DDT
76	264 130 000		6	13.5	250		5	1.45	100		1.4	UX5	T
77	265 113 000	G <sub>1</sub>	6	3	250	100	2.3	1.25	100	100	1.2	UX6	P
77E	265 113 000	G <sub>1</sub>	6	3	250	100	2.3	1.25	100	100	1.2	UX6	P
78	265 113 000	G <sub>1</sub>	6	3	250	125	10.5	1.65	100	100	1.6	UX6	P
78E	265 113 000	G <sub>1</sub>	6	3	175	75	4	1.1	100	75	1.1	UX6	P
79	274 163 000	G <sub>1</sub>	6	0	250		5.3	1.8	150		1.8	UX6	TT
80	298 300 000		5				60		REC		20mA	UX4	RR

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

P	005 231 600	G <sub>1</sub>	11.5	1	100	100		7	100	100	6	B7	116/Pen
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T	642 310 000		4	6	200		9	2	100		2	B5	154V
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VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE	
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V			
80M	289 300 000		5				60		REC		20mA	UX4	RR	
81	280 300 000		7.5				60		REC		20mA	UX4	R	
82	289 300 000		2.5				60		REC		20mA	UX4	RR	
82V	389 200 000		2.5				60		REC		20mA	UX4	RR	
83	289 300 000		5				120		REC		30mA	UX4	RR	
83V	398 200 000		5				60		REC		20mA	UX4	RR	
84	289 130 000		6				30		REC		15mA	UX5	RR	
85	269 813 000	G <sub>1</sub>	6	20	250		8	1.1	100		1.1	UX6	DDT	
85AS	268 913 000	G <sub>1</sub>	6	20	250		8	1.1	100		1.1	UX6	DDT	
88	289 300 000		5				60		REC		20mA	UX4	RR	
89	265 113 000	G <sub>1</sub>	6	10	100	100	9.5	1.2	100	90	1.2	UX6	P	
90	264 413 000		2.5	0	150		3.5	1.4	150		1.4	UX6	T	
90AC	642 310 000		4	12.5	200		40	7.5	100		7	B5	T	
92	264 413 000		6	0	250		3.5	1.4	100		1.4	UX6	T	
95	265 413 000		2.5	20	325	300	42	2.3	100	PenLF	2.3	UX6	P	
96	281 300 000		10				120		REC		30mA	UX4	R	
98	289 130 000		6				30		REC		15mA	UX5	RR	
100AC	642 310 000		4	6	200		5	2	100		2	B5	T	
104V	642 310 000		4	1	100		15	3.5	100		3.5	B5	T	
112A	364 200 000		5	4.5	90		5	1.575	80		1.5	UX4	T	
114B	020 000 300	A <sub>1</sub> G <sub>1</sub>	1.4	4.0	175			1.1	100		1.1	A08	T	
117L7	126 458 310		117	{ 5.2	100	100	60		REC		20mA	{ 5.3	A08	RP
							43	5.3	100	90				
							60		REC		20mA			
117M7	126 458 310		117	{ 5.2	100	100	43	5.3	100	90	5.3	{ 5.3	A08	RP
							60		REC		20mA			
117Z3	002 381 000		117				60		REC		20mA	B7G	R	
117Z4	020 080 310		117				60		REC		20mA	A08	R	
117Z6	029 180 310		117				60		REC		20mA	A08	RR	
120	642 310 000		2	12	150		12		100			B5	T	
124AC	542 310 000	A	4	1.4	200	60	1.6	0.9	100	60	0.9	B5	P	
142BT	026 540 310		14	8.5	200	200	29	3.7	100	100	3.7	A08	P	
144V	642 310 000		4	8	200		6	1.4	100		1.4	B5	T	
164V	642 310 000		4	9	200		12	3.4	100		3.4	B5	T	
181	264 300 000		3	30	175		16	1.05	100		1.05	UX4	T	
182A	264 300 000		5	45	200		18	1.5	100		1.5	UX4	T	
182B	264 300 000		5	35	250		18	1.5	100		1.5	UX4	T	
183	264 300 000		5	60	250		30	1.7	100		1.7	UX4	T	
185BT	020 540 310	A	18	18	200	200	100	9.5	100	100	8	A08	P	
200A	264 300 000		5	0	50		1.5	0.67	No Data Available			UX4	T	
202DDT	809 231 600	G <sub>1</sub>	20	3	200		3	2.4	150		2.4	B7	DDT	
202MPG	545 231 600	G <sub>1</sub>	20	1.5	200	100	3.0		100	100		B7	H	
202SPB	061 231 500	G <sub>1</sub>	20	1.5	250	100	4.8	2.8	100	100	2.8	B7	P	
202STH	545 231 600	G <sub>1</sub>	20	1.5	250	100	4		100	100		B7	H	
202VP	041 231 500	A	20	1.5	250	100	4.3	2.2	100	100	2.2	B7	P	
202VPB	061 231 500	G <sub>1</sub>	20	1.5	250	100	4.3	2.2	100	100	2.2	B7	P	

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
203THA	545 231 600	G <sub>1</sub>	20	2	250	100	3.5		100	100		B7	H
210DDT	682 390 000	G <sub>1</sub>	2	1	100		2.3	1.1	100		1.1	B5	T
210DET	642 300 000		2	4.5	150		3	1.1	100		1.1	B4	T
210DG	642 350 000		2	1	100				100			B5	T
210HF	642 300 000		2	3	150		1.6	1.5	100		1.5	B4	T
210HL	642 300 000		2	3	150		1.6	1.1	100		1.1	B4	T
210LF	642 300 000		2	4.5	150		4.8	1.4	100		1.4	B4	T
210PG	645 230 700	G <sub>1</sub>	2	—	150	40	1.1		No Data Available			B7	H
210RC	642 300 000		2	0	150		0.4						
210RC	642 300 000		2	1.5	150		0.85	0.8	150		0.8	B4	T
210SPG	645 230 700	G <sub>1</sub>	2	—	150	40	1.1		No Data Available			B7	H
210SPG	645 230 700		2	0	150		0.4						
210SPT	041 230 500	A	2	1	150	60	2.9	1.3	150	60	1.3	B7	P
210T	264 300 000		7.5	32	350		16	1.55	100		1.55	UX4	T
210VPA	041 230 500	A	2	1	150	60	2.9	1.1	150	60	1.1	B7	P
210VPT	041 230 500	A	2	1	150	60	2.9	1.1	150	60	1.1	B7	P
215P	642 300 000		2	7.5	150		10	2.25	100		2.2	B4	T
215SG	542 300 000	A	2	1	150	60	2.5	1.1	150	60	1.1	B4	P
217A	228 300 000		10				120		REC		30mA	UX4	R
220B	446 230 700		2	1	125	6			125			B7	TT
220DD	892 310 000		2						D			B5	DD
220HPT	642 350 000		2	4.5	150	150	8	2.5	100	100	2.5	B5	P
220IPT	040 230 500	A	2	1.5	125	60	2.2	1	100	60	1	B7	P
2200T	642 350 000		2	4.5	150	150	9.5	2.5	100	100	2.5	B5	P
220P	642 300 000		2	7.5	150		11	2.25	100		2.2	B4	T
220PA	642 300 000		2	4.5	150		10	4	100		4	B4	T
220PT	642 350 000		2	9	150	150	19	2.5	100	100	2.5	B5	P
220SG	542 300 000	A	2	1	150	60	3.1	1.6	100	60	1.6	B4	P
220TH	645 230 700	G <sub>1</sub>	2	—	100		1.7		100			B7	H
220TH	645 230 700		2	0	125	60	0.6						
220VS	542 300 000	A	2	1	150	60	3.6	1.6	100	60	1.6	B4	P
220VSG	542 300 000	A	2	1	150	60	5	1.6	100	60	1.6	B4	P
225DU	082 323 900		2				15		REC		10mA	B7	RR
230	642 300 000		2	20	150		18	3	100		3	B4	T
230PT	642 350 000		2	15	150	150	14	2	100	100	2	B5	P
230XP	642 300 000		2	18	150		22	3	100		2	B4	T
240B	446 230 700		2	1	125		8.5		100			B7	TT
240QP	446 235 700		2	12	150	150	6		100	100		B7	PP
244	264 130 000		2	6	150		5.5	1	100		1	UX5	T
244V	642 310 000		4	5.5	200		5.5	2.8	100		2.8	B5	T
245A	265 130 000	G <sub>1</sub>	2	1.5	150	50	4.8	0.75	No Data Available			UX5	P
247A	206 040 030		2	4.5	150		3.2	0.94	100		0.94	A08	T
249B	223 300 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
252A	264 300 000		5	50	400		60	3.4	100		3.4	UX4	T
255	268 943 000		2	3	150		0.8	0.57	100		0.5	UX6	DDT

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
257	264 530 000		5	21.5	125	100	20	1.35	100	90	1.3	UX5	P
259A	265 130 000	G <sub>1</sub>	2	1.5	175	75	5.5	1.38	100	75	1.3	UX5	P
259B	265 130 000	G <sub>1</sub>	2	1.5	175	75	5.5	1.38	100	75	1.3	UX5	P
262B	261 300 000	G <sub>1</sub>	10	4.5	150		2.8	0.9	100		0.9	UX4	T
264	264 300 000		1.1	9	150		2.5	0.64	100		0.64	UX4	T
271A	264 130 000		5	30	400		37.5	2.9	100		2.9	UX5	T
272A	264 130 000		10	15	150		5.4	0.76	100		0.76	UX5	T
274A	289 300 000		5				60		REC		20mA	UX4	RR
275A	264 300 000		5	4.5	200		47	2.7	100		2.7	UX4	T
281A	264 530 000		5	60	150	75	35	1.47	No Data Available			UX5	P
283A	265 130 000	G <sub>1</sub>	2	1.5	175	75	5.9	1.36	100	75	1.36	UX5	P
285	265 130 000	G <sub>1</sub>	2	12	175	150	8.8	0.88	100	100	0.88	UX5	P
286A	265 113 000	G <sub>1</sub>	2	1.5	175	75	6.2	1.2	100	75	1.2	UX6	P
290A	265 113 000	G <sub>1</sub>	10	1.5	175		5.4	1.22	150		1.2	UX6	P
291A	275 641 300	G <sub>1</sub>	10	$\begin{Bmatrix} 3 \\ 7.5 \end{Bmatrix}$	$\begin{Bmatrix} 175 \\ 175 \end{Bmatrix}$	75	4.5 3.1		No Data Available			B7	H
292A	268 913 000	G <sub>1</sub>	10	6	150	75	2.1	0.66	100	60	0.66	UX6	DDP
293A	265 413 000		10	18	175	175	14.5	1.05	100	100	1.05	UX6	P
302THA	645 231 700	G <sub>1</sub>	30	$\begin{Bmatrix} 2 \\ 2 \end{Bmatrix}$	$\begin{Bmatrix} 100 \\ 250 \end{Bmatrix}$	100	1.5 3.5		100 250	100		B7	H
303A	268 943 000		2	6	150		2	0.64	100		0.64	UX6	DDT
304AC	542 310 000		4	2	200	100	3	1.9	100	100	1.9	B5	P
309A	265 413 000		10	1.5	175	75	4.8	1.1	100	60	1.1	UX6	P
310A	265 113 000	G <sub>1</sub>	10	3	150	150	5.5	1.8	100	100	1.8	UX6	P
310B	265 113 000		10	3	150	150	5.5	1.8	100	100	1.8	UX6	P
311A	265 130 000	G <sub>1</sub>	10	15	150	150	30	2.8	100	100	2.8	UX5	P
324A	200 300 000	D <sub>1</sub>	5				5		D			UX4	R
328A	265 113 000	G <sub>1</sub>	7.5	3	150	150	5.5	1.8	100	100	1.8	UX6	P
329A	265 130 000	G <sub>1</sub>	7.5	15	150	150	37.5	3.3	100	100	3	UX5	P
332Pen	026 540 310		33	8.5	200	200	45	8	100	100	7	A08	P
337A	265 113 000	G <sub>1</sub>	10	3	150	150	6.3	1.6	100	100	1.6	UX6	P
345A	289 130 000		6				60		REC		20mA	UX5	RR
347A	020 600 310	G <sub>1</sub>	6	4.5	150		2.8	0.9	100		0.9	A08	T
349A	026 540 310		6	14	250	250	30	4.2	100	PenLF	4.2	A08	P
351A	028 090 310		1				120		REC		30mA	A08	RR
352A	268 913 000	G <sub>1</sub>	10	6	150		2.1	0.65	100		0.65	UX6	DDT
354 V	642 310 000		4	4.5	250		6.5	3.5	100		3	B5	T
361A	243 560 000		1.4		50	40	0.4	0.57	No Data Available			UX5	P
362A	243 560 000		1.4		50	50	1.26	0.57	No Data Available			UX5	P
383A	120 406 030		6		125		7.5	2.8	100		2.8	A08	T
401A	264 300 000		5	9	50		1.5	0.8	No Data Available			UX4	T
402	264 300 000		3	40	175		40	1	100		1	UX4	P
402-OT	005 231 600	G <sub>1</sub>	40	12	250	250	32	7	100	PenLF	7	B7	P
402P	000 231 600	G <sub>1</sub>	4	12.5	200		20	7.5	100		7	B7	P
402Pen	005 231 600	G <sub>1</sub>	40	6.7	200	200	40	7	100	100	7	B7	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
402PenA	005 231 600	G <sub>1</sub>	40	9	150	150	56	8	100	100	8	B7	P
405BU	892 300 000		4				15		REC		10mA	B4	RR
406	642 300 000		4		150		5.5	0.5	100		0.5	B4	T
410HF	642 300 000		4	2.5	200		0.2	0.22	100		0.2	B4	T
410P	642 300 000		4	16	250		12	1.8	100		1.8	B4	T
410RC	642 300 000	A	4	2.5	200		0.2	0.2	100		0.2	B4	T
410SG	542 300 000		4	1	200	100	4.5	0.9	100	100	0.9	B4	P
415PT	642 350 000		4	25	300	200	20	1.7	100	PenLF	1.7	B5	P
415QT	642 350 000		4	25	300	200	20	1.8	100	PenLF	1.8	B5	P
415SP	642 300 000		4	18	150		11	1.6	100		1.6	B4	T
425PT	642 350 000		4	17	250	150	12	1.3	100	100	1.3	B5	P
441U	892 300 000		4				60		REC		20mA	B4	R
442BU	892 300 000		4				60		REC		20mA	B4	RR
450	642 300 000		4	55	250		50	3.5	100		3.5	B4	T
450	264 300 000		7.5		400		55	2.1	100		2.0	UX4	T
450AC	542 310 000	A	4		200	100	3.5	3	100	100	3	B5	P
460BU	892 300 000		4				60		REC		20mA	B4	RR
482A	264 300 000		5	45	200		18	1.5	100		1.5	UX4	T
482B	264 300 000		5	35	250		18	1.5	100		1.5	UX4	T
483	264 300 000		5	60	250		30	1.7	100		1.7	UX4	T
484V	642 310 000		4	2.5	200		0.25	1.2	100		1.2	B5	T
485	264 130 000		3	9	175		5.8	1.4	100		1.4	UX5	T
486	026 040 300		3	3	90		3	0.61	80		0.6	A08	T
500	892 300 000		4				30		REC		15mA	B4	RR
506	892 300 000		4				30		REC		15mA	B4	RR
506BU	892 300 000		4				30		REC		15mA	B4	RR
506K	892 300 000		2				30		REC		15mA	B4	RR
509	892 300 000		2				60		REC		20mA	B4	RR
605	642 300 000		4	6	150		10	1.4	100		1.4	B4	T
615	642 300 000		4	41	150		4	1.4	100		1.4	B4	T
620T	642 300 000		6	95	400		62.5	2.3	100		2.3	B4	T
660	642 300 000		6	100	400		120	2.3	100		2.3	B4	T
680XP	642 300 000		6	100	400		3.5	1.1	100		1.1	B4	T
713A	021 415 360		6	2	125	125	7.5	3.95	100	100	3.9	A08	P
717A	021 415 360		6	2	125	125	7.5	4	100	100	4	A08	P
731A	412 365 100	A	6	2.3	150	150	7	4.3	100	100	4	B7G	P
805	642 300 000		6	6	150		10	1.4	100		1.4	B4	T
807	254 130 000		6	12.5	300	250	83	6.5	100	PenLF	6	UX5	P
816	200 300 000		2.5				120		REC		30mA	UX4	R
825	642 300 000		6	0	150		6	1.4	150		1.4	B4	T
836	2** 00* 300	D <sub>1</sub>	2.5				120		REC		30mA	B7G	R
840	254 130 000	A	2	3	175	75	1	0.4	100	60	0.4	UX5	P
842	264 130 000		7.5	100	400		25	1.25	100		1.25	UX5	T
843	264 130 000		2.5	25	350		25	1.7	100		1.7	UX5	T
864	364 200 000		1.1	4.5	90		2.9	0.61	80		0.61	UX4	T

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
866	200 300 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
866B	200 300 000	D <sub>1</sub>	5				120		REC		30mA	UX4	R
866Jr	280 300 000		2.5				120		REC		30mA	UX4	R
871	200 300 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
879	300 200 000	D <sub>1</sub>	2.5				5		D			UX4	R
904V	642 310 000		4	2	200		2	2	150		2	B5	T
950	041 230 500	A	2	16.5	175	150	7	0.95	100	100	0.95	B7	P
985	289 130 000		5				30		REC		15mA	UX5	RR
986	289 300 000		5				60		REC		20mA	UX4	R
994V	642 310 000		4	0	100			3.6	100		3.6	B5	T
I005	008 092 030		6				30		REC		15mA	A08	RR
I201	426 141 630		6	3	175		5.5	3	150		3	B8B	T
I201	892 300 000		25						D			B4	DD
I203	200 800 130		6						D			A08	D
I203A	200 800 130		6						D			A08	D
I204	526 141 310		6	2	250	100	1.75	1.2	100	100	1.2	B8B	P
I206	265 441 730		6	2.5	250	100	4.5	2.1	100	100	2.1	B8B	PP
I221	265 113 000	G <sub>1</sub>	6	3	250	100	2	1.22	100	100	1.2	UX4	P
I223	026 510 310	G <sub>1</sub>	6	3	250	100	2	1.22	100	100	1.2	A08	P
I229	265 300 000	G <sub>1</sub>	2	3	150	75	1.7	0.64	100	75	0.64	UX4	P
I230	264 300 000		2	9	150		3		100			UX4	T
I231	265 104 130		6	30	300	300	13	6.3	100	100	6.3	B8B	P
I232	265 114 130		6	2	250	100	6	4.5	100	100	4.5	B8B	P
I273	265 104 130		6	3	250	100	2.2	1.5	100	100	1.5	B8B	P
I274	028 090 310		6				30		REC		15mA	A08	RR
I275	289 300 000		5				120		REC		30mA	UX4	RR
I280	265 104 130		12.5	3	250	100	2.2	1.5	100	100	1.5	B8B	P
I282	265 114 130		6	2	300	150	10	5.8	100	150	5.8	B8B	P
I284	265 104 130		12.5	3	250	100	9	2	100	100	2	B8B	P
I288	364 204 730		1.4	0	90		5.2	1.85	80		1.85	A08	TT
I291	274 304 620		1.4		90		5.2	1.85	80		1.85	A08	TT
I292	364 204 730		1.4	0	90		5.2	1.85	80		1.85	A08	TT
I293	260 004 030		1.4		90		4.7	1.3	80		1.3	A08	T
I294	200 800 130		1.4						D			A08	D
I299	365 004 230		1.4	4.5	150	90	10.2	2.4	100	90	2.4	B8B	P
I560	289 300 000		5				60		REC		20mA	UX4	RR
I560	892 300 000		5				60		REC		20mA	B4	RR
I561	892 300 000		4				60		REC		20mA	B4	RR
I562	280 300 000		7.5				120		REC		30mA	UX4	R
I602	264 300 000		7.5	23.5	250		10	1.33	100		1.33	UX4	T
I603	265 113 000	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	UX6	P
I609	364 520 000		1.1	1.5	125	75	2.5	0.725	100	75	0.72	UX5	P
I610	264 530 000		2.5	16.5	250	250	31	2.5	100	PenLF	3.8	UX5	P
I611	026 540 310		6	16.5	250	250	34	2.5	100	PenLF	2.5	A08	P
I612	026 540 310	G <sub>1</sub>	6	3	250	100	5.3	1.1	100	100	1.1	A08	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
1613	026 540 310		6	16.5	250	250	34	2.5	100	PenLF	2.5	A08	P
1614	026 540 310		6	18	350	250	54	5.2	100	PenLF	5.2	A08	P
1616	200 300 000	D <sub>1</sub>	2.5				120		REC		30mA	UX4	R
1619	026 540 310		2.5	10	300	250	45	4.5	100	PenLF	4.5	A08	P
1620	026 510 310	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	A08	P
1621	026 540 310		6	16.5	250	250	34	2.5	100	PenLF	2.5	A08	P
1622	026 540 310		6	18	350	250	54	5.2	100	100	5.2	A08	P
1624	026 540 310		2.5	20	400	300	25		100	PenLF		A08	P
1626	026 040 310		12.5	32	250		20	2.1	100		2.1	A08	T
1631	026 540 310		12.5	18	350	250	54	5.2	100	PenLF	5.2	A08	P
1632	026 540 310		12.5	8	200	100	50	9.5	100	90	9	A08	P
1633	471 461 230		25	8	250		11.5	2.6	100		2.6	A08	TT
1634	074 461 230		12.5	2	250		2	1.325	150		1.3	A08	TT
1635	027 446 310		6	0	300		3.5	0.9	100		0.9	A08	TT
1637	026 500 310	G <sub>1</sub>	6	18	250	250	32	3.8	100	PenLF	3.8	A08	P
1638	029 180 310		6						D			A08	DD
1639	026 890 310	G <sub>1</sub>	6	5.5	250		5	2	100		2	A08	DDT
1644	414 752 360		12.5	9	175	175	13	2.15	100	100	2.1	A08	PP
1649	021 415 360		6	2	300	150	10	9	100	100	8	A08	P
1654	2** 00* 300	D <sub>1</sub>	1.4						D			B7G	D
1655	074 461 230		6	2	250		2	1.325	200		1.3	A08	TT
1659	268 913 000	G <sub>1</sub>	2.5	2	250		0.9	1.1	150		1.1	UX6	DDT
1662	364 526 300		1.4	8.4	150	90	13.3	1.9	100	75	1.9	B7G	P
1664	026 985 310	G <sub>1</sub>	2.5	3	250	125	10	1.325	100	100	1.3	A08	DDP
1801	892 300 000		4				15		REC		10mA	B4	RR
1805	892 300 000		4				30		REC		15mA	B4	RR
1807	892 300 000		4				30		REC		15mA	B4	RR
1810	003 200 000	D <sub>1</sub>	4				30		REC		15mA	B4	R
1815	892 300 000		4				60		REC		20mA	B4	RR
1817	892 300 000		4				120		REC		30mA	B4	RR
1831	892 300 000		4				30		REC		15mA	B4	RR
1851	021 415 360		6		300	150	10	9	100	100	8	A08	P
1852	021 415 360		6		300	150	10	9	100	100	8	A08	P
1853	021 415 360		6	3	300	200	12.5	5	100	150	5	A08	P
1861	892 300 000		4				60		REC		20mA	B4	RR
1867	389 200 000		4				60		REC		20mA	UX4	RR
1875	023 000 000	D <sub>1</sub>	4				5		D			8SC	R
1876	123 000 080		4				5		D			8SC	R
1877	002 300 000	D <sub>1</sub>	4				3		D			B4	R
1882	023 080 090		5				60		REC		20mA	8SC	RR
1883	023 080 090		5				60		REC		20mA	8SC	RR
2101	264 530 000		2	4.5	150	150	8	1.7	100	100	1.7	UX5	P
2102	268 943 000		2	1	100		2.5	1.3	100		1.3	UX6	DDT
2103	274 546 300		2	7.5	150	150	4	1.6	100	100	1.6	UX7	PP
2151	265 413 000		14	31	250	250	47	2.4	100	PenLF	2.4	UX6	P

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

T	642 300 000		4	8	150		75	1.27	100		1.2	B4	4019B
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T	642 310 000		6	20	400		60	10	100		8	B5	4033L
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P	412 365 100		6	1	250	100	11	4.4	100	100	4.4	B7G	5749
H	412 366 400		6	1	100		25	7.2	100		6	B7G	5750



VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	la mA	mA/V	Anode Volts	Screen Volts	mA/V		
2506	892 300 000		4				15		REC		10mA	B4	RR
3006	802 300 000		4						D			B4	D
3481	026 510 310	G <sub>1</sub>	6	13.5	150	150	5.5	1.8	100	100	1.8	A08	P
3720	364 200 000		5	1.5	175		0.2	0.2	150		0.2	UX4	T
3871	264 300 000		30	19	100	100	52	3.8	100	90	3.8	UX6	P
3872	364 200 000		2	9	150		3		100			UX4	T
3873	365 200 000	G <sub>1</sub>	2	3	150	75	1.7	0.64	100	75	0.6	UX4	P
3921	264 300 000		2.5	50	250		34	2.17	100		2.1	UX4	T
3924	265 130 000	G <sub>1</sub>	2.5	3	175	90	4	1	100	90	1	UX5	P
4021B	642 300 000		4	8	125		23	3	100		3	B4	T
4033A	642 310 000		6	20	400		50	9	100		8	B5	T
4033	264 130 000		6	20	400		50	9	100		8	UX5	T
4037A	802 300 000		4				120		REC		30mA	B4	R
4074A	204 140 300	A <sub>1</sub> A <sub>2</sub>	6	13	300		15	3	100		3	UX7	TT
4077A	003 200 000	D <sub>1</sub>	5				120		REC		30mA	B4	R
4608	642 310 000		4	6	150		11	2.5	100		2.5	B5	T
4610	542 310 000	A	4	1.3	200	100	1.5	0.9	100	100	0.9	B5	P
4618	542 310 000	A	4	2	200	100	3	2.2	100	100	2.2	B5	P
4631	264 300 000		2	1.5	150		0.7		150			UX4	T
4657	642 310 000		4	1.5	200		1	2.2	200		2.2	B5	T
4670	432 564 570		2	8.5	90	90	1		80	75		8SC	PP
4673	642 310 000	G <sub>1</sub>	4	2.5	250	200	8	5	100	PenLF	5	B5	P
4682	023 100 560	G <sub>1</sub>	4		375	250	24		100	PenLF		8SC	P
4683	023 004 060		4		350		43		100			8SC	T
4684	023 104 560		4		375	250	24		100	PenLF		8SC	P
4688	023 104 560		4		375	275	48		100	PenLF		8SC	P
4689	023 104 560		6		375	275	48		100	PenLF		8SC	P
4694	023 104 560		6		375	250	24		100	PenLF		8SC	P
4699	023 104 560		6	12.5	300	300	55	13	100	PenLF	9	8SC	P
5516	235 242 300	A	3	14	400	250	75	4	100	PenLF	4	A08	P
5590	412 365 100		6		90	90	3.9	2	80	90	2	B7G	P
5591	412 365 100		6		175	150	10		175	100		B7G	P
5603	021 415 360		6		150	150	50	5.4	100	100	5.4	A08	P
5608	412 365 100		6	12	125	125	7.5	5	100	90	5	B7G	P
5618	265 134 200		3	8	275	75	19	3.5	100	60	3.5	B7G	P
5654	412 365 100		6	2	125	125	7.5	5	100	100	5	B7G	P
5659	026 540 310		12.5	12.5	250	250	32		100	PenLF		A08	P
5660	026 895 310	G <sub>1</sub>	12.5	3	250	125	10	1.325	100	100	1.3	A08	DDP
5661	021 415 360		12.5	0.4	250	100	9.2	2	100	100	2	A08	P
5679	218 309 120		6				5		D			B8B	RR
5687	641 221 437		6	12.5	250		16	4.1	100		4.1	B9A	TT
5691	471 461 230		6	2	250		2.3	1.6	150		1.6	A08	TT
5692	471 461 230		6	9	250		6.5	2.2	100		2.2	A08	TT
5693	021 415 310		6	3	250	100	3	1.65	100	100	1.6	A08	P
5722	902 208 300		3						D			B7G	D

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
P	401 230 561		6	3	250	100	1.8	1	100	100	1	B9A	5879
H	412 365 100		6	0	75	75	6.3	2	80	75	2	B7G	5915
TT	741 226 413		6	0	75		8	2.8	80		2.8	B9A	5963
TT	762 344 100		6	1	100		9.5	6	100		6	B7G	5964
													6042
TT	741 226 413		6	2	250		1.2	1.6	150		1.6	B9A	6057
RR	192 310 800		6				5		D			B7G	6058
P	041 230 651		6	3	250	100	2	1.225	100	100	1.2	B9A	6059
TT	741 226 413		6	2	250		10	5.5	200		5	B9A	6060
P	*41 230 651		6	13	300	225	34	3.75	100	150	3.7	B9A	6061
P	601 235 144		6	7.5	250	250	45	7	100	150	7	B9A	6062
RR	802 309 100		6				30		Rec		15mA	B7G	6063
P	412 361 500		6	2	250	250	10	7.5	100	150	5	B7G	6064
P	412 361 500		6	2.5	250	250	8	2.5	100	100	2.5	B7G	6065
DDT	412 389 600		6	3	250		1	1.2	150		1.2	B7G	6066
TT	741 226 413		6	8.5	250		10.5	2.2	100		2.2	B9A	6067
TH	023 164 570	G <sub>1</sub>	6	2	100		16	5	100		5	8SC	6153T
				2	250	100	12	3.5	100	100	3		

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
5763	601 235 144		6	7.5	250	250	45	7	100	PenLF	7	B9A	P
5812	413 365 200		3	23	250	250	40	4.1	100	PenLF	4.1	B7G	P
7000	026 510 310	G <sub>1</sub>	6	3	250	100	2	1.225	100	100	1.2	A08	P
7184	026 540 360		6	15	250	250	70		100	PenLF		A08	P
7193	020 000 310	A G <sub>1</sub>	6	10.5	300		11	3	100		3	A08	T
7700	265 113 000	G <sub>1</sub>	6	3	250	100	2		100	100		UX6	P
7752	412 365 100		6	2	125	125	5.5	3.5	100	100	3.5	B7G	P
7755	412 365 100		6	7.5	175	90	2.9	1.75	100	75	2.7	B7G	P
7756	106 052 430		6	36	300	300	58	4.3	100	PenLF	4.3	A08	P
8013A	200 300 000	D <sub>1</sub>	2.5				15		REC		10mA	B4	R
8020	200 300 000	D <sub>1</sub>	5				120		REC		30mA	UX4	R
9001	412 365 100		6	3	250	100	2	1.4	100	100	1.4	B7G	P
9002	612 364 100		6	7	250		6.3	2.2	100		2.2	B7G	P
9003	412 365 100		6	3	250	100	6.7	1.8	100	100	1.8	B7G	P
9006	812 380 100		6				5		D			B7G	R

TYPE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	VALVE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

EM31	026 540 310			6	5		250	250				2	A08
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E1320	026 540 310			6	11		250	250		4	1		A08
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UM34	025 465 310			15 2	{ 5 16		250 250	250 250		1	{ 1 1 }		A08
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6M1	026 540 310			6	22.5		250	250		0.23	1		A08
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VALVE	SELECTOR SWITCH No.			T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
						Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
AC/ME	045	231	600			4		22		250	250		0.24	1	B7
AM1	023	104	560			4		5		250	250		0.095	2	8SC
DM21	206	540	030			1.4				90	90		0.025	2	A08
EMI	023	104	560			6		5		250	250		0.095	2	8SC
EM3	023	104	560			6		18		200	200		0.176	1	8SC
EM4	023	164	560			6	{	4.2		200	200			1	} 8SC
								12.5		200	200			1	
EM34	026	456	310			6	{	5		250	250			1	} A08
								16		250	250			1	
EM35	026	540	310			6		22		250	250			1	A08
E130	026	540	310			6		15		250	250			1	A08
FT4	026	540	310			4		6		250	250			1	A08
ME4S	023	104	560			4		5		250	250			2	8SC
ME6S	023	104	560			6		5		250	250			2	8SC
ME41	216	040	530			4		22.5		250	250		0.23	1	M08
ME91	216	040	530			9		17		150	150		0.135	1	M08
ME920	045	231	600			9		19		175	175		0.18	1	B7
PM5	206	546	130			6	{	15		200	200			1	} A08
								5		200	200			1	
TV4	023	104	560			4		5		250	250			1	8SC
VFT4	026	540	310			4		20		250	250			1	A08
VME4	045	231	600			4		22		250	250			1	B7
VTF6	026	540	310			6		22		200	200			1	A08
Y61	026	540	310			6		22		250	250		0.24	1	A08
Y62	026	540	310			6		22		250	250			1	A08
Y63	026	540	310			6		22		250	250		0.24	1	A08
Y64	026	540	310			6		22		250	250			1	A08
Y65	026	540	310			6		11		250	250			1	A08
2E5	264	513	000			2.5		8		250	250		0.24	1	A08
6AB5	264	513	000			6		15.5		150	150		0.13	1	UX6
6AF7	026	457	310			6	{	4.5		200	200		0.16	1	} A08
								15		200	200		0.15	1	
6E5	264	513	000			6		7.5		250	250		0.2	1	UX6
6G5	264	513	000			6		22		250	250		0.24	1	UX6
6H5	264	513	000			6		22		250	250		0.24	1	UX6
6N5	264	513	000			6		15.5		150	150		0.13	1	UX6
6T5	264	513	000			6		22		250	250			1	UX6
6U5	264	513	000			6		22		250	250		0.24	1	UX6
41ME	023	104	560			4		5		250	250			1	8SC
63ME	026	540	310			6		22		250	250		0.25	1	A08
64ME	026	457	310			6	{	16		250	250			1	} A08
								2.5		250	250			1	
1629	026	540	310			12.5		8		250	250		0.24	1	A08
4678	023	104	560			6		5		250	250		0.095	2	8SC

## NOTES ON DATA GIVEN FOR A.V.T.

The data in the preceding pages for the “AVO” VALVE CHARACTERISTIC METER also gives sufficient information for the checking of valves with the “AVO” VALVE TESTER.

The data is presented in the following form :—

VALVE	SELECTOR SWITCH No.	T.C.	Vf	VALVE CHARACTERISTIC METER DATA					A.V.T. DATA			BASE	TYPE
				Neg Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		

By taking no account of the data shown in the columns specifically marked V.C.M., the data applicable to the A.V.T., is obvious.

Under the heading “Type”, in the case of multiple electrode valves, the following notes should be used regarding test procedure.

### R (Rectifiers)

To test rectifying valves for emission, set mA/V control at 100 and anode volts switch at “Rec”. Emission of each anode (in case of full wave) will be obtained by setting anode selector at “D<sub>1</sub>” and “D<sub>2</sub>” respectively. The two emissions should match within small limits and can be compared with the figures given in the mA/V column which indicates the order of emission to be expected.

### D, DD and DDD (Diodes)

These are tested for emission for each diode with anode volts switch at “D” and anode selector at “D<sub>1</sub>” and “D<sub>2</sub>”. Set mA/V control at “mA/V” when reading should be greater than 0.5 for a good diode. Readings will generally be between 2 and 5. Where the symbol “†” occurs amongst the selector switch set up figures, set to  $A_2^7$  and test for emission of third diode with Anode Selector at A<sub>2</sub>.

Where D<sub>1</sub> or D<sub>2</sub> appears under the heading “Top Cap” these should be connected to top cap “A” and tested with the anode selector at “Normal”.

		<i>Selector Switch</i>	<i>T.C.</i>	<i>Vf</i>	<i>Anode Volts</i>	<i>Base</i>	<i>Type</i>
E.g.	EA50	123 000 000	D <sub>1</sub>	6	D	B3G	D

Connect to Anode Top Cap (A) and check for emission of Diode with Anode Selector at “Normal”.

### DT, DDT, DP, DDP (Valves with another electrode assembly in addition to diode)

The mutual conductance of the triode or pentode section is checked with anode selector at "Normal". Emission figures for each diode are then obtained as above.

"†" See information given under the heading "Diodes" above.

### TT and PP (Double Electrode Assemblies)

The mutual conductance of each half of such a valve is obtained with the anode selector at "Normal" and A<sub>2</sub>.

Where no mutual conductance figure is given, each half of valve should be checked for matching of mutual conductance.

### TH, TP, O (Frequency Changers)

To test frequency changers two sets of figures are given, first check the triode (Oscillator) section with the anode selector at "Normal" and then the pentode (mixer) section with the selector at A<sub>2</sub>.

### SPECIAL NOTES

Due to the vast improvements in valve technique, the A.V.T. has limitations to its use. Notably the tendency to parasitic oscillations has greatly increased, and this should be borne in mind when high slope, short grid base valves of the all glass base construction are under test.

### INTERNAL CONNECTION (\*)

When the symbol \* appears among the Selector Switch, set up figures, it indicates that an unknown electrode may be connected to this pin internally. To obtain the complete Selector Switch coding, test with an ohmmeter between pin marked \* and all others. (The ohmmeter should be on a sufficiently low range to discriminate between a dead short and filament resistance). Dependent upon the electrode to which this pin is internally connected the correct code can be set up and normal test procedure followed.

Where the pin marked * is O.C to all others Set Roller to 0.									
"	"	"	"	"	"	"	connected to Cathode	Set Roller to	..... 1.
"	"	"	"	"	"	"	Heater —	"	..... 2.
"	"	"	"	"	"	"	Heater +	"	..... 3.
"	"	"	"	"	"	"	Grid	"	..... 4.
"	"	"	"	"	"	"	Screen	"	..... 5.
"	"	"	"	"	"	"	Anode	"	..... 6.
"	"	"	"	"	"	"	Anode 2	"	..... 7.
"	"	"	"	"	"	"	Diode Anode 1	Set Roller to	..... 8.
"	"	"	"	"	"	"	Diode Anode 2	"	..... 9.

### 1.4 Volt Dry Battery Valves

To obtain the filament supply for the 1.4V series, set the filament voltage switch to 10 volts and the toggle switch on the valve holder panel to ÷ 7 position. The toggle switch must always be returned to "Normal" after such tests. Where the Filament Voltage Extension Unit is used, 1.4 volts can be obtained direct by setting to 1.4 V, but in these circumstances the ÷ 7 toggle switch must be left at "Normal."

### Accessories for A.V.T.

Where the filament voltage is greater than that obtainable from the main panel, this can be obtained from the Avo Valve Tester Voltage Extension Unit which is supplied as an accessory.

If the valve base required does not appear on the Valve Holder Panel it is necessary to use an adaptor which plugs into the Octal Holder. These are supplied as follows :—

- |                     |                                    |
|---------------------|------------------------------------|
| No. 1. B7G and B8A. | No. 4. B3G. Hivac D.A.4 and 5 pin. |
| No. 2. B9G.         | No. 5. Blank.                      |
| No. 3. B8B.         | No. 6. UX7 (6A7 Base).             |
|                     | No. 7. B9A.                        |

#### **Special Note re use of V.B.A. No. 2**

When using this data in conjunction with the B9G base, Pin 1 must be connected to  $H_{3+}$ , and Pin 8 connected to  $H_2$ . In these circumstances most types will give heater/cathode short which can be ignored. Apart from the filament connections referred to all other set up figures will remain as printed, but pin 9 should be connected to  $\phi$ . Eg. EF50. Using Valve Base Adaptor No. 2. Selector Switch Number will read 356 101 420.

#### **Old Type Panels**

Note that the foregoing information does not apply to the now obsolete English and American panels without roller switch.



